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ABSTRACT

The various activities carried out under a grant from the Cancer Society are discussed, including preparatory work, pilot and exploratory studies, the conduct of the major study, and additional activities. The bulk of the report, however, is devoted to the major study in which measures were obtained of: 1) patterns of support for smoking; 2) subjective expected utility for the outcomes of smoking or not smoking; 3) smoking history; 4) manifest anxiety level; and 5) locus of control. In addition, one hundred and five subjects participated in one of three relevant role play situations or in one of two possible control groups. Post experimental measures were taken as well as five day and six month follow-ups. No significant differences were found in either the long-range or short-range change in smoking among the experimental groups. The author concludes that the problem of control of smoking will continue to pose great difficulties. (TL)

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Summary of activities: Grant TH4

1. Preparatory work (Jan.-Jun., 1969). A previous study using role playing as a technique for persuading smokers to stop smoking was in the final stages of long-range follow-up and analysis of data at the time when grant TH4 began. Funds from this grant were used to support long-range follow-up, to pay for computer time and the assistance of statistical clerks in the final analyses of these data. The results of this prior study were instrumental in establishing the techniques and hypotheses central to the major study supported by the grant. Grant funds were also used to support some of the work needed for preparation of the published report on the prior study.

2. Pilot and exploratory studies (Jun., 1969-Jan., 1970). Most of the first year of the grant period was spent in pilot studies and in discussions of experimental design. Several new associates joined our group. They were Judith S. Mausner, M.D., Associate Professor of Epidemiology at the Medical College of Pennsylvania, Alice Isen, Ph.D., Research Associate in Social Psychology at Swarthmore College, and Peter Moller, M.A., Assistant Professor of English and Theatre at Beaver College. A series of experimental trials using a variety of role playing procedures was carried out with undergraduates at Beaver College as subjects. As a consequence of these trials two major changes were made in the procedure of the study. The first was the choice of an adult rather than a college student sample for the study. We felt that our ability to generalize to the population at large from the results of a study of adults was a more valuable gain than the academic advantages to be obtained from replicating the earlier study by using college students. Similarly, we felt that both men and women should be engaged in the study,

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rather than men only as in the earlier work.

The second change was in procedure. We had planned to test the hypothesis that the "patient's" role in the early study was ineffective because of the subject's high level of personal involvement. We had originally hoped to manipulate level of involvement by contrasting an "acting" with a "personal" set. This proved to be difficult. During the period of pilot studies we gradually evolved the procedure finally used.

3. The conduct of the study (Jan.-Aug., 1970). This period was used for the conduct of the role playing study. The first three months were spent in making contacts with potential subject populations. We were finally successful in winning the cooperation of the Parents' Association of the Upper Moreland School District in suburban Philadelphia. The study itself was run from March, 1970, when the first pre-tests began, to August, 1970, when the last of the post-experimental assistance sessions were held. The remainder of 1970 was used for preliminary assessment of the data.

Long-range follow-up was begun in January, 1971 and completed in March of that year. Final computer analyses were carried out during the spring and summer of 1971. The final report was prepared during the fall of 1971 and the winter of 1972.

4. Additional activities. During the period when the preparatory work on the major study was carried out our team also participated in the work of several smoking clinics in the community. With the cooperation of the Philadelphia chapter of the Cancer Society we planned a large scale study with the Marine Corps Supply Depot personnel in Philadelphia. In this study we planned to carry out an experimental assessment of group role playing. Unfortunately, although a great deal of preliminary work was invested in the planning of the study and the preparation of materials, the

administration of the supply depot withdrew permission for the study.

5. Summary of the major study. Parents belonging to the Parents' Associations of three schools, two grade schools and one high school, were interviewed by telephone to determine smoking status. All smokers and a random sample of ex-smokers and non-smokers were invited to attend a pre-experimental testing session in which measures were obtained of patterns of support for smoking, subjective expected utility for the outcomes of smoking or not smoking, smoking history, manifest anxiety levels and locus of control (internal/external).

The smokers were asked to participate in further research. The 105 who came were divided into five groups: (1) Role-playing, doctor's role, (2) Role-playing, a writer interviewing a doctor, (3) Role-playing, a writer who himself becomes a patient, (4) a group which learns facts about smoking and health but does not role-play and (5) Role-playing, irrelevant (automobile safety). Following these activities subjects repeated the test of subjective expected utilities and completed a questionnaire concerned with their reactions during the study. Levels of smoking were obtained by telephone interview five days and six months after the subjects' participation.

Results: There were no significant differences in either long-range or short-range change in smoking among the experimental groups. However, one-third of the subjects playing the "doctor's" role did cut down their smoking levels by 1/2 pack or more, a result consonant with the findings of the previous study. The "writer, non-patient" role led to the least change in smoking. This finding disconfirms the hypothesis that the failure of "patients" in the previous study to change was due entirely to their personal involvement in the role.

In a further analysis, data from all subjects were combined. A multiple regression analysis of predictors of reduction in smoking showed that, as had happened in the previous study, subjects who believed that stopping smoking would have favorable results reduced their levels of smoking significantly more than subjects who did not. The utility of continuing to smoke, however, was not significantly related to change. However, one consequence of the experiment was that subjects who were convinced that continuing to smoke would have deleterious effects on health did reduce their levels of smoking more than subjects whose utilities in this area were not affected. Unfortunately, many of the subjects who changed following the experiment were "dissonant" smokers, i. e. they had high scores on various scales of the Test of Patterns of Support concurrently with a belief that they would benefit from stopping. Most of these returned to their earlier levels of smoking by the time of a six-month follow-up.

The results of this study are considered to indicate that the problem of control of smoking will continue to pose great difficulties. An increasing proportion of smokers will be "dissonant," in McKennel's terms. That is, they will be convinced of the necessity for stopping but will be unable to do so because of a firm belief that continuing to smoke is psychologically necessary. A search for methods to assist such smokers to overcome their lack of confidence in the possibility of living without cigarettes is vitally necessary.

A Study of Cigarette Smoking Among Adults[1]

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Beaver College

The evidence linking cigarette smoking to lung cancer, emphysema, heart disease and a variety of other ills continues to grow. Yet, progress in eliminating cigarettes is slow. Despite the drop in smoking among men from almost half the adult male population to approximately 40%, the widespread persistence of the use of cigarettes in men, its very slow decrease among women, and its rise among adolescents (Horn, 1971), are all powerful indicators of the pressing social need for ways of combatting cigarette smoking.

To understand the persistence of cigarette smoking, one must answer three questions.

1. Why do people smoke?
2. Under what circumstances and for what reasons do some people decide to stop smoking?
3. What factors determine whether an individual succeeds or fails in an attempt to stop smoking?

1. The research reported in this paper was supported under grant TH4 from the American Cancer Society. The writer wishes to acknowledge the assistance of Judith S. Mausner, Alice Isen and Peter Moller in the development of the design and of Roger Dombrow and the officers of the Upper Moreland School District Parents Association for arranging the participation of the subjects. Dr. Judith Mausner edited the final manuscript. A preliminary version was read at the April, 1971 meeting of the Eastern Psychological Association.

The studies reported in this paper reflect on the first two questions directly and give some peripheral information relative to the third. The basic approach has been derived from an application of an ecological model of smoking behavior described in detail elsewhere (Mausner & Platt, 1971). The essential character of this model is presented in the initial section of Appendix A. In brief, the model presents cigarette smoking as a consequence of a variety of environmental influences which operate through their effect on psychological and physiological systems within the individual. One must examine the forces in the physical, social, and biological environment which stimulate smoking. One must study the relation between these forces and the ideas, values, attitudes, beliefs, and feelings of the smoker. And then one must study smoking behavior as it is imbedded in a total range of activities which make up the smoker's pattern of life.

In previous research the writer has focused on three aspects of cigarette smoking. The first of these was specification of the patterns of support for smoking. This work is based on theoretical analyses (Mausner, 1966; Horn & Waingrow, 1966; Tomkins, 1966) which argue that smoking furnishes a number of different kinds of reward which operate in varying proportions among individual smokers to reinforce the tendency to smoke. A psychological test of patterns of support for smoking (see Appendix B) was developed based in part on the work of Horn and Waingrow (1966) and in part on previous work by the writer (Mausner & Platt, 1971).

The second area of focus was the study of the factors which determine an individual's decision to continue smoking or to stop. The basic approach here

has been the use of a model derived from the concept of subjective expected utility (Edwards, Lindeman & Philips, 1965; Raiffa, 1970). This model uses two components to assess the attractiveness of one decision over another, the value placed on various outcomes of a decision and the expectation that these outcomes will actually obtain. A psychological test measuring the subjective expected utilities of smoking or not smoking (see Appendix B) was developed (Mausner & Platt, 1971).

The third element in our research is an attempt to relate change in smoking behavior to the measures of patterns of support and subjective expected utilities. Retrospective studies of these relationships have many weaknesses. Unfortunately, the number of subjects needed for a prospective study of factors predicting spontaneous change in smoking behavior would be enormous. The research of Horn and his colleagues at the Clear .inghouse for Smoking and Health is an example of such an approach.

The current study represents another approach to prospective study, one which examines change in smoking in a relatively small group subjected to persuasive influence. The source of this influence is a procedure which has in the past yielded enough short-range change in smoking behavior to permit examination of the determinants of change. This procedure is "role playing" as developed initially by Janis and his colleagues (Janis & King, 1954; Janis & Mann, 1965; Mann & Janis, 1968). One major limitation in such an approach is the possibility that the determinants of change are peculiar to the situation in which change is elicited. It is necessary, therefore, in retrospective studies of

spontaneous change to search for corroborative evidence in order to determine the degree to which generalizations about the factors which lead to a decision to stop smoking may be properly inferred from the results of experimental manipulation like role playing. Nevertheless, the fact that role playing has been found successful to a limited degree in inducing temporary reductions in smoking levels among some smokers made it a promising vehicle for a further investigation of these important issues.

A Brief Summary of Research on Role Playing

A "role" may be defined as a complex of behaviors which are associated with a status, a given position in a social structure. The role is usually defined in terms of the expectations people hold of the behavior associated with a specified social status. In "role playing" a person pretends to fulfill the demands of a role which may or may not actually coincide with his own social position. Thus, a boy seeking insight into his relations with his father may pretend to be a father in a scene in which the father is interacting with a child. This use of role playing as a source of individual insight and personal growth has been widely used by clinical psychologists for many years. It has also been used for training purposes in industry, education, and social agencies.

As early as the mid-1950's Janis (Janis and King, 1954) determined that role playing could be used in the laboratory to generate change in opinion. This was accomplished by having a subject play a role in which he was required to express an opinion contrary to that which he had previously held. The reasons for the effectiveness of this procedure have been discussed at length by social psychologists (Elms, 1967; Zimbardo, 1965). One school, associated with Janis and his colleagues, feels that change following role playing is produced by the dispassionate review of arguments occasioned

by the attention-arousing properties of the novel situation. Zimbardo, in an approach derived from cognitive dissonance theory, holds that the effort involved in playing the role must be justified and that the justification of effort leads to change in opinion.

The use of role playing in industry, psychological therapy, and education implies that acting in a manner contrary to one's usual behavior would not only change attitudes but would actually lead to changes in behavior. The implication of the illustration given above of the young man's playing the role of a "father" is that this would lead to greater insight into the feelings of fathers and sons, and presumably, would result in a clarification of the issues which disturbed the relation between the protagonist and his own father. This should then lead to better interactions. Experimental study of changes in behavior following the clinical or industrial use of role playing have not been common. The widespread use of role playing in therapy and training has been almost entirely unevaluated. Some experimental verification of the effect of role playing on behavior was furnished by Janis and Mann (1967) in their studies of the impact of role playing on cigarette smoking. They found that young women who pretended to be patients with lung cancer faced by the prospect of an operation reduced their level of cigarette smoking immediately after the experience of role playing and maintained this reduction on a long-range follow-up. Similar but smaller reductions in smoking immediately following the experience of role playing were reported by Platt, Krasson and Mausner (1969) and Lichtenstein and his colleagues (Lichtenstein, Keutzer, and Himes, 1969).

In a large scale study of role playing among male college students Mausner and Platt (1971) found that playing the role of a patient faced by evidence of the effect

of smoking on his own physiology did not lead to either immediate or long-range cessation of smoking. However, about one-third of a group of subjects playing the role of a physician in the interaction described above did temporarily cut down their smoking levels by substantial amounts (1/2 pack or more). Observers watching such an interaction through a one-way screen showed a similar rate of reduction. The following factors differentiated subjects in all experimental groups who changed from those who did not:

1. Most "changers" did not report a craving for cigarettes, or the use of cigarettes for the relief of tension.

2. Reduction or cessation of smoking could be predicted from change in the subjective expected utility of stopping smoking but not in the utility of continuing to smoke. That is, subjects who were convinced by the role playing interaction that they would be benefited from not smoking were likely to make the decision to try to cut down or stop. However, there was no lawful relation between change and an increase in fear of the consequences of continuing to smoke.

3. A major predictor of the likelihood that subjects would stop smoking was their expectation that they would be able to change their smoking behavior.

4. The degree to which anxiety was aroused by the experiment was not a predictor of either decision to change or actual change.

5. Factors in the personality of the subject, such as manifest anxiety levels, risk-taking tendencies, internal or external orientation, and a tendency to put one's

best foot forward, were associated indirectly rather than directly with the subject's response to role playing. These associations involved the interaction between a characteristic of the personality and either one of the patterns of support for smoking or some aspect of change in subjective expected utility. For example, subjects who were internally oriented, i.e. felt they had control over their own lives, reduced or eliminated smoking after the experiment, but only if their SEU was affected.

For about half the "changers," the reductions which followed role playing were short-lived. Some insights into the reason for this were provided by the long-range follow-up which indicated that some of the subjects who decided to cut down or stop on the basis of an increase in the subjective expected utility of not smoking were unable to maintain this decision because of the high level of dependence on smoking to fulfill needs for tension reduction or in response to craving.

These studies left a number of unanswered questions. The research carried on under the current grant was devoted primarily to an attempt to find answers to some of these questions.

Goals of the Current Research

One of the issues raised by the previous studies was the degree to which the findings could be generalized beyond the male college students who were the

subjects in the role-playing experiment. Thus, it was viewed as important to replicate the experiment with adults, especially adult women.

A second issue was raised by a difference in reaction among those subjects playing the role of doctor, patient, or those who merely observed the role playing. As was pointed out above, the level of change was significantly higher among doctors and observers than in the control group while the level of change among "patients" and controls was essentially similar. A major goal, therefore, was to test several hypotheses advanced to account for the difference in reaction of "doctors" and "patients":

1. The doctors were active in carrying out their role. They initiated the interaction, tried to convince the patients of the benefits of not smoking, in general seemed to enjoy the role of "running the show." In contrast, the "patients" were relatively passive. Although they participated vigorously in the interaction, they rarely took initiative. The one point in the scenario where they had to participate actively was a section in which they challenged the doctor about his own cigarette smoking and asked whether he planned to stop. However, aside from this, the patient was a receiver rather than a giver. Brehm (1966) has suggested that subjects exposed to strong attempts to change their attitudes and behavior develop a feeling of resistance which he labels "reactance." This resistance would inhibit the acceptance of persuasive

arguments among patients. Zajonc (1966) has suggested that the feeling of being in charge is sufficiently rewarding so that people who are allowed to initiate in an interchange are more likely to accept a novel idea than those who are on the receiving end. This might explain the decrease in smoking among the "doctors."

2. The role of the patient led to a much higher degree of self-referral than did the role of the doctor, as evidenced in a post-experimental questionnaire. Patients tended almost immediately to focus on their own cigarette smoking. In fact, they very often left the role and tried to query the experimenter who was playing the role of "doctor" about the effects of smoking in their own lives. The hypothesis was advanced that the focus on self inhibited change by reawakening all of the defenses and rationalizations which most smokers use to enable themselves to continue smoking. Thus, the very characteristic of role playing which should have led patients to stop smoking, i.e. the arousal of emotions, may have been self-defeating. In contrast, the role of the doctor created a dispassionate, disinterested set which encouraged a re-examination of issues involved in smoking.

3. It is possible that the "doctors" learned the information presented during the role playing better than the patients. The doctors had to prepare to play their role

by becoming familiar with details about the harmful effects of smoking which they then had to transmit to the patients. The patients' preparation merely consisted of a general orientation on the nature of the interaction in which they were to engage. Thus, it could have been proposed that the difference in the effectiveness of the two roles stems from the greater opportunity for familiarity with anti-smoking arguments provided to the doctor.

Two considerations make this argument somewhat unlikely. The first is that the observers reduced smoking levels almost as much as the doctors. However, both the experimenters' observations and reports from the subjects indicated that the observers attended very closely to the scene in front of them. The observers' task was to rate the role players on emotionality and adequacy of involvement in the role playing. Thus, presumably their opportunities for learning were great. On the other hand, there is an indication from prior research (Mausner and Platt, 1966) that even a high level of learning derived from the study of programmed learning materials did not lead to significant changes in smoking behavior. Unfortunately, in the role-playing experiment with male college students there was no measure of the degree to which the content of the role playing scenario was learned. Thus no direct test of the hypothesis which attributes differences in response between "doctors" and "patients" to learning was carried out.

In summary, the current experiment had two major goals. The first was to reproduce the manipulations of prior experiments in role playing to attempt to verify our earlier conclusions about the impact of patterns of smoking and subjective expected utility on changes in smoking levels. The second goal was to test several hypotheses about the difference in the effectiveness of the "doctor's" and "patient's"

roles in the previous experiment.

Several decisions were taken in order to fulfill these goals. The first of these was to work with a population of adults, both men and women. While in some ways it would have been desirable to do a genuine replication of the previous study with college students as subjects, it was felt that the need to demonstrate the generality of the findings outweighed the undoubted need to replicate. The second decision was to set up an experiment in which enough change in smoking behavior could be expected to test predictions of reduction or cessation from patterns of support for smoking and from subjective expected utility. For several reasons it was decided not to focus on prediction from variations in the personality of the subjects, although two measures of personality traits, the Taylor Manifest Anxiety Scale and the Rotter test of Internal/External control were included because both of these had yielded interesting interaction effects in the previous study.

Two hypotheses were tested to explore reasons for differences in reaction between "doctors" and "patients." The first was the attribution of the failure of "patients" to cut down or quit to their inability to maintain a disinterested set which would permit careful examination of the issues. This was tested by the addition of a new group to the "doctors" and "patients" of the previous study. All subjects playing opposite a "doctor" began by playing the role of a writer seeking information about the operation of the anti-smoking clinic in which the "doctor" is working. For half af the subjects in the "writer's" role the scenario revolved around a discussion of the progress through the clinic of an anonymous patient who

represented the typical smoker. These subjects were expected to adopt a disinterested but receptive set. The other half of the "writers" were required to pretend to become patients themselves and thus undergo all of the experiences characteristic of the patient's role in the prior study. These "writer-patients" were expected to develop a self-oriented set.

The second hypothesis was that the "doctors" changed only because they had better opportunities to learn new facts about smoking. To test this a group of subjects were given the opportunity through tape-recorded briefings and the reading of semi-programmed materials to learn the information included in the scenario used by the role players, without actually participating in role playing.

Summary. The current study included five experimental groups. The first played the role of "doctor" in an anti-smoking clinic. The second played the role of "writer-non-patient" who came to the clinic to gather material for a Sunday supplement article concerning the work of the clinic and was exposed to the detailed case history of a typical patient. The third was a "writer-patient" who initially came to the clinic to gather material for an article, but then decided, or was persuaded, to enter the clinic as a patient and go through the routine clinic procedures. The fourth group did not participate in role playing but, instead, worked through semi-programmed materials covering the content of the scenario. This consisted primarily of information concerning the deleterious effect of smoking on the lungs and the cardio-vascular system as well as information about the benefits of cessation. The fifth group participated in role playing concerning a health educator's program dealing with automobile safety. There was

no mention of smoking in this scenario.

The following hypotheses were tested:

1. Smokers whose positive subjective expected utility for stopping is increased following role playing will reduce or eliminate smoking at a much greater rate than smokers whose subjective utility for stopping is not affected. In contrast, change in subjective expected utility for continuing to smoke induced by role playing will not be lawfully related to reduction or cessation in smoking

2. Smokers whose scores on the Test of Patterns of Support for Smoking indicate a dependence on smoking for the fulfillment of major needs will be less likely to reduce or stop smoking following role playing than those whose smoking does not show such a dependence. These patterns include the use of cigarette smoking for tension reduction, in response to craving, to improve the quality of social interaction, or to enhance the sense of self. Scores related to the simple hedonic properties of smoking, such as the "pleasure" scale, will not be systematically related to reduction or cessation.

3. Subjects playing the role of "doctor" will reduce or eliminate smoking at a significantly higher rate than the "writer-patients" or non-role playing subjects.

4. Subjects playing the role of "writer-non-patient" will show change similar to that shown by "doctors." Positive findings would confirm the thesis that the changes in "doctors" were due to a disinterested set which led to an unemotional examination of the issues in smoking, rather than to other aspects of the "doctor's" role.

5. Learning the facts about the effects of smoking on the lungs and cardiovascular system without role playing will not lead to change in smoking behavior even among subjects whose learning is equivalent to that produced by role-playing experiences.

Subjects and Procedures

Population

A large pool of smokers was needed from whom we could select subjects. We considered it important not to work with volunteers since as a group they might include many individuals virtually ready to stop smoking or very unlikely to stop because they had previously made many unsuccessful attempts to stop.

In several previous research experiences we had found it useful to work through the parents' associations of a school and to reward participation in the experiment by a donation to the association. Although, obviously, no one would be forced to participate in the experiment, it was hoped that the cooperation of the parents' association would create a situation in which participation would be related only minimally to the participants' individual psychological patterns or their concern with the issues of the study.

To recruit subjects we approached the parents' associations of schools in the Upper Moreland School District in Montgomery County, near Philadelphia. The general goals of the project were outlined at a meeting attended by officers of the parents' associations of all six schools in the district. The project was

presented as a study of "new ways of teaching facts about health" supported by the American Cancer Society. The fact that cigarette smoking was to be one of the issues was mentioned but not emphasized.

We proposed that the parents' association furnish a list of members to the project staff, and that we would call all members in a preliminary contact to identify the smokers. Unfortunately, several of the officers present had strong feelings against the release of membership lists, possibly as a result of a generally negative attitude toward social research or because of a fear of invasion of privacy. Despite these feelings, the parents' associations of three of the six schools, the high school and two grade schools, did agree to participate.

A preliminary letter was sent to all parents of students in these schools over the signature of the parents' association president. The letter introduced the project and gave members the opportunity to ask that their names be removed from the list. Those who did not return a post card requesting removal from the list were called by telephone. All of the cigarette smokers identified, a random sample of ex-smokers, and a smaller random sample of non-smokers were invited to pretest sessions at one of the schools. Table 1 indicates the number of families on the lists, the number telephoned, the number of smokers identified and the level of participation at each step in the project.

Insert Table 1 about here

Several points should be made about this initial contact with the parents. In each family one informant, the parent who first answered the phone, was asked about the smoking status of himself or herself and of the other parent. This information was only used for the purpose of making appointments. All smoking levels used for treatment of the data were obtained individually during pretest sessions. The sole exception was the comparison of reported smoking levels from preliminary telephone interview and long-range follow-up for those subjects who did not attend a pretest.

Only adults were considered a possible part of the project population. That is, even when students in the high school were identified as cigarette smokers, they were not included in the study. It is noteworthy that of the 626 smokers who were identified, only 460 were willing to consider making an appointment, only 405 made appointments for the pretest, and of these only 165 actually came even though many were called as often as four times and made as many as three or four re-appointments. In contrast, of the 273 ex-smokers who made appointments, 144 participated in the pretests, and of the 124 non-smokers, i.e. people who had never smoked, 56 actually came. Thus the proportion of smokers who were willing to take the first step in the experiment was very much smaller than the number of non-smokers or ex-smokers who responded to our invitation. As noted above, the community was aware of the fact that cigarette smoking was one of the subjects which would be covered in the study, although an attempt had been made to avoid identifying the study as one concerned primarily with smoking. It is hard to know

whether the lower rate of return among smokers was due to the possibility that smokers, especially male smokers, felt more harried by the pressure of work and social engagements than non-smokers or ex-smokers, or whether the smokers were simply more negative about the prospect of participating in a study in which they might be asked about their cigarette smoking.

The Pretest

The pretest was administered to groups of approximately 40 to 80 subjects who met in a school cafeteria. The pretest battery was presented as a set of questionnaires designed to determine opinions and feelings about various subjects relevant to health, and about some related personal characteristics. It was made clear that some but not all of the participants would be invited to Beaver College to take part in further research on the same issues and that the battery was a preliminary to that further work.

The pretest battery consisted of the following: (cf. Appendix B)

1. The Taylor Manifest Anxiety Scale
2. The Rotter Test of Internal/External Orientation
3. The Mausner-Platt Test of Subjective Expected Utility for the outcomes of decision to continue to smoke or to stop
4. A Test of Patterns of Support for Smoking which is an expanded version of the Horn-Waingrow Test of Insight
5. A schedule requesting information about the participant's age, sex, occupation, education, smoking levels, and past history of smoking

Items one, two, and five were the same for all subjects. Item two, the Test of Subjective Expected Utility, was given in two versions. One was designed for current smokers, the other asked ex-smokers or non-smokers to contrast the likelihood of occurrence of various outcomes if they should decide to continue not to smoke or to begin smoking. The Test of Patterns of Support was given to both smokers and ex-smokers. The first group of ex-smokers tested was given the standard test and asked to try to remember the factors which had determined their previous smoking. Because some ex-smokers felt that this wording was confusing, the test was revised and a new form written which asked ex-smokers how they "used to feel about smoking."

Procedure for the Role-Playing Experiment

Among those who had completed the pretest, all who smoked 1/2 pack or more daily were placed in a pool of potential subjects. Since they were called in an order corresponding roughly to the order of participation in the pretests, the time interval between the pretest and the invitation to participate in the experiment was held about constant.

A schedule of available hours for each day the experiment was run was given to a member of the staff along with a list of potential subjects. These were then called and asked to make an appointment to come to the College. Those who accepted appointments were assigned to one of the five experimental groups on the basis of a table of random numbers. The assignment was made in such a way that the experimental conditions were rotated evenly and that a proportionate number of men and women was assigned to each of the groups. To preserve

confidentiality all test forms and other records were identified only by code number.

On arrival subjects were identified by a member of the staff who was aware of the study group to which the subject had been assigned. The subject's first activity was to listen to a recorded briefing which described the setting of the role playing or, for the control groups, the appropriate activity.

Procedure for the Subjects in Role-Playing Groups

The initial briefing was the same for subjects in all three role-playing groups. That is, it described the contact between physician and writer in terms which would be useful to both potential physician and writer. The subject was not told whether he would play physician or writer to encourage him to attend closely to all aspects of the briefing.

When the tape-recorded briefing was completed the subject was assigned to play physician or writer in the first scene. He was then given written cue cards and semi-programmed materials which desicribed the content of his part in the scene. He was given approximately five minutes to master these semi-programmed materials and was then taken to the experimental cubicle in which the role playing was to take place. For transcripts of the taped briefings and texts of other materials, See Appendix C .

The cubicle was arranged to simulate a doctor's office. The furnishings included a desk, a telephone, two chairs, an X-ray viewing box with a chest X-ray, a white coat, and a stethoscope. The person playing the role of physician, either staff member or subject, wore the white coat and was encouraged to hold the stethoscope.

During the first scene the person playing the role of the writer introduced himself and informed the physician that he was gathering material for an article in a Sunday supplement on the operations of the anti-smoking clinic. The physician then launched into a brief discussion of the work of the clinic, focusing on the fact that patients in the clinic were given a series of screening tests to determine the effect of smoking on the lungs and cardiovascular system. The "writer" was encouraged to take notes on a pad furnished for this purpose. When the role of "writer" was played by a subject, the staff member playing "physician" did not know during the first part of the interaction whether the subject had been assigned to the "writer-patient" or the "writer-non-patient" condition. After the detailed exposition by the physician of the damaging effects of smoking, and of ways of determining whether an individual is suffering these damaging effects, the physician discussed ways of convincing patients that they would be better off if they did not smoke. During the playing of this scene, the subject playing either role was permitted to consult his cue cards in order to refresh himself both about the sequence of events and the actual content of the interactions. However, the subjects were instructed to try to be as spontaneous as possible and improvise rather than read the material from the cue cards. The instructions emphasized that the subjects were supposed to act.

At the close of the scene the physician, either staff member or subject, was called by telephone and given one of two sets of instructions. In the first alternative, he was to ask the writer to undergo the tests himself and then return for a report about the effects of smoking on his own health. In the second he (or

she) was given the opportunity to follow a typical patient who had just been tested and would be returning for his report. Subjects who played the role of physician were always instructed to suggest that the writer participate as a patient. Subjects playing the role of writer were assigned to one of the two conditions on the basis of the prior random selection.

The staff member who was role playing opposite the subject then left the cubicle. The assistant stepped in long enough to start the taped briefing for the second scene appropriate to the subject's assignment. At its conclusion the assistant returned and shut off the tape recorder.

The second scene was set "one week" after the first. To open this scene the staff role player entered and was re-introduced by the assistant as "Doctor _____" or as Mr. _____ or Mrs, _____, the writer. The physician presented the other participant with a series of laboratory tests purported to be those of a "typical patient" or of the writer himself or herself (see Appendix C). The first test, a tracing of the patient's purported breathing record, showed considerably diminished forced expiratory volume. The doctor compared this record to that of a normal non-smoker. He indicated that the record suggested some spasm or accumulation of mucus or possibly even destruction of tissue in the patient's lungs. If the subject was a "writer-patient," he was reassured that if he or she were to stop smoking, it was likely that there would be considerable improvement not only in the breathing record but also in ability to climb stairs or engage in sports. For "writer-non-patient," the doctor described similar assurances given the "typical patient."

The next test was a sputum cytology report which indicated cells in "Stage Three," that is, suspicious cells. This was presented as meaning that the patient did not have cancer, but did have some abnormal process in his lungs.

The final test was a serum cholesterol report which showed a level somewhat higher than normal. The patient was told that this indicated an increased risk of a heart attack which would be exacerbated if the patient continued to smoke. As was indicated before, these tests were presented to the writer-non-patient as being the results from tests of a typical patient, to the writer-patient as being his own tests.

The remainder of the interaction dealth with recommendations for stopping smoking and a discussion of the considerable improvement in health that could be expected if the patient stopped smoking. Again, the writer-non-patient was instructed to get as much information as possible about the way in which the physician approached his "typical patient" so that he could describe this interaction in his magazine article. The writer-patient was also to write an article which would revolve around his own reactions to the experiences of being a patient. The scene ended with the writer thanking the doctor for his help in preparing the article and promising that he would return in six months, either (for the writer-non-patient) to check up on the "typical patient" and his progress, or (for the writer-patient) to report on his own success in stopping smoking.

Procedure for Control Groups

The fourth group, the control group designed to test the effect of learning without role playing, was given a tape-recorded message and semi-programmed

materials which covered all of the essential facts included in the role-playing scenario. These materials presented the relation between smoking and the physiological processes discussed in the role playing. They also described the improvement in health that would result from stopping smoking.

The steps in the procedure for the last group were essentially the same as those for the subjects participating in role playing about smoking, but the scenario instructed these subjects to act as writers interviewing a health educator who is preparing a campaign for automobile safety. The script aimed for the same amount and specificity of information about automobile safety as was presented in relation to cigarette smoking. A member of the staff played the role of health educator opposite the subject.

Post-Experimental Activities

When the activities described above had been completed, subjects were taken to a quiet room where they were asked to complete a post-experimental battery. This included a questionnaire concerning their thoughts during the experiment, a measure of situational anxiety aroused by the experiment, a repetition of the Test of Subjective Expected Utility concerning the outcomes of smoking or not smoking, and a test of information covering the facts in the script on smoking and also that on automobile safety. In addition, all subjects were invited to participate in assistance sessions designed to help people who wanted to try to stop smoking. (cf. Appendix D.)

Appendix C gives a detailed description of the procedures of the experiment and the scripts of the tape-recorded briefings presented to each group

of subjects.

Follow-up

There were two follow-up telephone interviews, one five days and the other six months after the subject's participation in the experiment. For the forms of these interviews, see Appendix E . In the first subjects were queried about the number of cigarettes they had smoked during the preceding 24 hours. They were also asked if there had been any recent changes in their levels of smoking.

In the long-range follow-up, the subjects were not only asked about their current smoking status but also about any events in their history of smoking during the preceding six months. An attempt was made to determine whether there had been any changes in smoking status during that interval and to pinpoint as precisely as possible the point at which those changes took place. In addition, the interviewer queried the subject concerning any exerpiences he or she might have had in attempting to stop smoking. The respondents were also asked about recollections of their participation in the study. Care was taken to obtain the subject's reactions to the role playing for members of the role playing groups. The small number of subjects who actually participated in assistance sessions (see below) were queried concerning their recollections of these sessions and of the outcome.

Assistance Sessions

At the close of the experimental sessions all participants in the study were given the opportunity to participate in the assistance sessions. Of the 105 participants 48 expressed a desire to come. Analyses contrasting those subjects

who indicated interest in assistance sessions with those who did not are presented below.

Subjects were called approximately a week to 10 days after their participation in the experiment. All told, three groups of subjects began the series of assistance sessions although the attrition was so considerable that after a time the groups were combined. Only 17 of the 48 subjects who showed an interest in assistance sessions actually attended even one session. The most devoted participant attended ten sessions; in contrast, several subjects attended only one meeting. Overall, 19 sessions were held. Appendix F gives details concerning the flow of participation in the assistance sessions and the procedure which was followed.

The assistance sessions were designed in a completely eclectic manner. That is, they included virtually every technique which the writer considered of any theoretical interest in helping people implement the decision to stop smoking. In the first session for each group, participants completed the test of Patterns of Support and scored it themselves. They were given a collection of hints to smokers differentiated according to varying patterns of support. The text of these Hints to Smokers may be found in Appendix 14 of Mausner and Platt (1971).

In another approach, they were instructed to pretend that they had been successful in stopping smoking and to write a letter to a friend describing their experiences in stopping. Participants were urged to keep diaries of their actual smoking between sessions to develop further insight into the function of smoking

in their lives. Lastly, there was a discussion of some of the medical aspects of smoking.

A large part of the time in subsequent assistance sessions, as is common in many smoking clinics, was devoted to having the subjects talk to each other in small groups about their experiences in trying to stop smoking. A theme which emerged from these discussions was the deep involvement of cigarette smoking in many facets of the participants' lives. A detailed discussion of the progress of these assistance sessions will be found in Appendix F. The results of the assistance sessions are described below (see page 47.)

Treatment of Data

A record for each subject was prepared on punched cards. This included scores on all tests and interviews, and information concerning personal characteristics and smoking status at each stage in the investigation. Responses on the tests of Patterns of Support for Smoking and Subjective Expected Utility were subjected to factor analysis. On the basis of a choice of Varimax Rotations, subscales were designed consisting of items with high loadings on individual factors. Table 2 shows the results of factor analysis of the patterns test, and Table 3 of the Test of Subjective Expected

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Insert Tables 2 and 3 about here

Utility. The tables indicate the items grouped under each of the scales and the factor loadings for these items. A score on each of the factor scales in both tests was obtained for each subject. For the Test of Subjective Expected Utility these scores included four elements. The first was the measure of the value placed on a given category of

outcomes defined by one of the factor scales. The second was the product of value and the expectation of the likelihood of occurrence of outcome should the subject continue to smoke. The third was the product of value times the likelihood of occurrence should the subject stop smoking. The fourth was the product of the value times the difference between the likelihood of occurrence of an outcome should the subject stop and the likelihood should he continue. The last of these scales expresses a utility for change in smoking status. A similar series of scores was also calculated for the total over the 40 items of values, SEU for stopping, SEU for continuing, and SEU for continuing minus stopping.

Change in both smoking levels and attitudes (as measured by SEU) was assessed in two ways. The first was through a simple change score. The second was through the use of regressed scores. To obtain these the regression equation based on the relation of pre-experimental to post-experimental scores was obtained. We then calculated the subject's expected score based on the regression equation. The regressed score was the difference between the actual and the expected score. It was calculated for smoking levels, for the overall measures of SEU (i.e., value, SEU for continuing to smoke, SEU for stopping, SEU for change in status), and for each of the factors in the SEU test. The use of these regressed scores permitted a flexible approach to multivariate analysis in which a measure taking pre-experimental levels into account could be entered into matrices, used for multiple regressions, and also for the equivalent of analysis of covariance.

In a final treatment subjects were dichotomized according to absolute changes

in smoking levels. We have found previously that a decrease of at least half a pack of cigarettes a day usually signifies that the smoker is making a substantial attempt to limit his smoking; smaller changes may reflect little more than errors in reporting. Therefore we classified as "changers" those subjects whose reported smoking levels after the experiment were one-half pack or more below the pre-experimental levels, as "non-changers" those whose levels of smoking remained the same, increased, or changed by lesser amounts. The "changers" also included those who stopped smoking entirely.

Results

The results of this study will be presented in the following order:

1. Description of the outcome of the factor analysis of the tests of Patterns of Support for Smoking and Subjective Expected Utility for the consequences of continuing to smoke or stopping smoking. These findings will be compared with the results of different study populations.

2. Presentation of the data pertinent to the "personality of the smoker." This will consist primarily of study of the interrelations between the test of Manifest Anxiety and factor scores on the Test of Patterns of Support for Smoking.

3. Comparison of Subjective Expected Utilities in smokers, ex-smokers, and non-smokers.

4. Comparison of the patterns of support among current smokers and ex-smokers.

5. Analysis of the results of role playing and other experimental manipulations.

6. Prediction of change in smoking from measures of SEU and Patterns of Support.

Factor Analyses of the Test of Patterns of Support and Subjective Expected Utility

The outcomes of factor analyses are presented in Tables 2 and 3. While there are some minor differences in the factor loadings and in the presence of one or another item in the various scales, both tests reveal essentially the same array of factors and the same levels of loadings encountered in similar factor analyses of data from this test completed by male and female college students.

As before, the social aspects of smoking can be divided into factors relating to stimulation from receiving or offering cigarettes on the one hand and factors dealing with a kind of social self-concept or feeling of closeness on the other. As we shall see, the latter factor is of some importance in predicting the behavior of adult smokers.

Table 2-A gives means and standard deviations and an intercorrelation matrix of the factor scores for those subjects who actually participated in the role-playing experiment. As usual, Varimax rotation does not yield fully independent factors. However, in no instance is more than 40% of the variance in one factor predictable from variance in another.

The mean factor scores indicate the nature of supports for smoking among our subjects. Most of them see simple pleasure as well as tension release and response to craving as important supports for their smoking. Somewhat less important but still frequently cited are the social aspects of smoking. As we have found before, relatively few people verbalize the use of smoking to support self-concept.

The Test of Subjective Expected Utility broke down into concepts relating to positive and negative aspects of smoking. One factor dealt with the positive consequences of not smoking. Another dealt with the negative consequences of not smoking, particularly those involved in an inability to reduce tension. A third dealt primarily with the negative effects of continued smoking on health, although there was one item with the opposite loading which dealt with living longer than the average man. A fourth scale described positive hedonic and aesthetic affects of continuing to smoke; a fifth and sixth scale dealt with the positive outcomes of continuing to smoke on social interactions and on one's ability to continue functioning. In summary, the factors derived from analysis of the Test of Patterns and SEU seem to be stable and to hold for different generations, i.e. college students and adults.

The "Personality of the Smoker"

It has been widely reported that smokers are more anxious than non-smokers. It should, therefore, have been reasonable to expect that in our population smokers and non-smokers would differ in average scores on the Taylor Test of Manifest Anxiety. In actuality, however, there is no such simple relation. Table 4 compares non-smokers

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Insert Table 4 about here

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with smokers above and below 300 on the factor of psychological addiction or craving on the Test of Patterns of Support. There is a highly significant difference among the groups, but the difference lies between smokers above and below the midpoint on the patterns test. Smokers who do not crave cigarettes are almost identical in mean MAS

score to non-smokers, but those who do crave cigarettes show a significantly higher level of manifest anxiety. Similar results are obtained when smokers above and below 300 on the use of smoking to relieve tension are compared with non-smokers; those who use cigarettes to relieve tension are significantly higher in manifest anxiety, whereas those who do not look almost exactly like non-smokers. In contrast, when smokers are split according to the extent to which they use cigarettes because of simple enjoyment, both the groups of smokers above and below the mean on this scale resemble non-smokers. This finding almost exactly reproduces the results from male college students in our previous study. (Mausner and Platt, 1971). While the current study does not explore other personality characteristics which have been proposed as typical of smokers, i.e. extroversion and neuroticism, it is highly probable that similar findings would emerge if the relevant psychological tests were administered to smokers for whom information concerning patterns of support were available.

Comparison of SEU scores among smokers above and those below the midpoint on Psychological Addiction

The SEU scores for the difference between smoking and not smoking of both groups of smokers, i.e. those above and below the midpoint on psychological

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Insert Table 5 about here

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addiction, are almost identical (see Table 5), while the non-smokers show very much more negative utilities. The scores presented in Table 5 reflect the degree to which the smoker feels that change in his cigarette smoking would have positive or negative

outcomes. It is, as was noted above, based upon the product of the value placed on each outcome and the difference in expectation assigned to continuing and stopping. However, when the utility measure is broken down into the SEU for continuing to smoke and that for stopping, some intriguing differences emerge. Non-smokers show a higher utility for not smoking than do either of the two groups of smokers, but the differences are not significant (see Table 6). In contrast, (see Table 7), the non-

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Insert Table 6 about here

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smokers show a very much greater aversion (i.e. negative SEU) for smoking, and the smokers, both those who are psychologically addicted and those who are not, place a rather high value on continuing to smoke. This difference is highly significant. One can translate this finding into simpler language by saying that both smokers and non-

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Insert Table 7 about here

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smokers think that stopping is a very good thing and have a considerable expectation that it would lead to desirable consequences. However, there is no question but that those people who are still smoking also consider that continuing to smoke is a very good thing, and see relatively little chance that the kinds of things that they really value would be affected by a change in their smoking status. Non-smokers are horrified by the prospect of what starting to smoke would do to them. The trends just described are not related to the extent to which smokers report craving; this contrasts

with the marked tendency for manifest anxiety levels to vary among those who do and do not report a craving for cigarettes.

Comparison of Ex-Smokers and Smokers on the Test of Patterns of Support for Smoking

A factor analysis was performed for the data derived from recollections of ex-smokers about the rewards of smoking. This factor analysis differed greatly from that based on analysis of protocols from at least four different groups of current smokers. When the data from ex-smokers were subjected to varimax rotation, a first factor which reflected a potpourri of supports continued to emerge no matter how large a number of factors was extracted. In the rotation chosen (see Table 8) that

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Insert Table 8 about here

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first factor included items relating to tension release, craving, pleasure, stimulation, social stimulation, and role definition. Several other factors did emerge. These include two social factors (factors 2 and 3), a "habit" factor (factor 4), a manipulative factor (factor 5), and a role-defininig factor (factor 6). Such a general first factor is usually characteristic of principal components analyses which are designed to uncover a "G" or generalized factor. It may represent a sort of undifferentiated nostalgia on the part of ex-smokers for the delights they have given up.

To further the comparison of patterns of support among those who succeeded in stopping and those who continued to smoke, we rescored the test of Patterns of Support from the smokers in our population, using factor scales derived from the ex-smokers. It seemed to us that the group of items in the first factor for the ex-smokers

would give a good picture of the degree to which a smoker perceives cigarettes as fulfilling important needs. When we compared ex-smokers and current smokers on this "general needs" factor, we found to our astonishment that the distributions were almost identical. (See Table 9.) A remarkably large proportion, almost half, of the ex-smokers' had scores above 300 on this factor. The implications of this finding for the relation

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Insert Table 9 about here

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between patterns of support and the ability to stop smoking will be discussed below.

Results of the Experimental Manipulations

The presentation to this point has consisted of internal analyses of the measures used in the study and of comparisons of smokers with non-smokers and ex-smokers drawn from the same population. We shall now shift to a report on the results of the role-playing experiment itself. The basic outline of the experiment is presented in Table 10. As was indicated above, two groups ("physicians" and "writer-patients")

Insert Table 10 about here

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engaged in role playing essentially equivalent to that of the subjects in our study of college students. A third group, the "writer-nonpatients," were intended to have an interested but personally uninvolved set. A fourth group learned facts about smoking and health and a fifth engaged in irrelevant role playing.

None of the analyses of short-range changes in smoking show significant differ-

ences among these groups (see Table II). There are some modest trends. The "doctors"

Insert Table II about here

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reacted similarly to those in the study of college students; about one-third reduced their levels of smoking by one-half pack or more. In contrast to the lack of change among the college students, many of the adult writer-patients did reduce their levels of smoking, but by minimal amounts (i.e. less than one-half pack per day). The lowest number of changers was found among the writer-nonpatients; virtually none reported any reduction in smoking. One major contrast with the earlier experiment was the fairly considerable amount of change among the control groups. It was this which led to the lack of significant differences among the groups when a planned comparison "t" contrasting regressed smoking scores for each group with every other was carried out (Hays, 1963). The writer-nonpatients actually showed less change in comparison with the controls. When a square-root transformation of the data is carried out, the writer-nonpatients show significantly less reduction in smoking than the "doctors."

The results of the long-range (i.e. six-month) and short-range follow-ups are similar (see Table 12) except that the experimental groups are even more alike in the

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Insert Table 12 about here

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former than in the latter. However, an assessment of the smoking of two groups which did not participate in the complete study reveals some interesting effects. The respondents

who completed the pretests but failed to take part in the role playing experiment showed lower levels of reduction in smoking than any of the experimental groups. Those PTA members who refused to attend the pre-test sessions not only did not decrease their levels of smoking; almost a third reported increased use of cigarettes.

It would be tempting to attribute an absence of increases and the occurrence of some decreases in smoking among participants to their experiences in taking the pre-tests or attending the experimental sessions. This is, of course, invalid, since the participants and non-participants were both self-selected. There are two alternate explanations for the differences between participants and non-participants. One is that merely taking the tests of Patterns of Support and Subjective Expected Utility led smokers to focus on inconsistencies between continued smoking and other beliefs about the importance of health and long life. This perception of inconsistency might have inhibited increase in smoking despite external stresses. The other explanation is that the participants came to the experiment because they were already somewhat negative towards smoking; non-participants may have refrained from coming because they were heavily committed to continued smoking and had no intention of letting anyone try to influence them.

It is our impression that the latter explanation is more likely than the former. Although we cannot support this impression directly, interviewers did report that respondents who refused to participate were often defensively hostile to the interviewers. It should be stressed that we felt it ethically necessary to make it known that smoking was one of the subjects of the study. Had we been more secretive, if less ethical, the results of our investigation might have been very different.

One difference among the experimental groups was in the level of situational

anxiety. Subjects playing the role of doctor reported significantly higher levels of situational anxiety on the post-experimental questionnaire than did the other role-playing subjects. However, an examination of the protocols indicates that the source of this anxiety was not in the content of the role playing itself, but in the uncertainty faced by people who were, in large part, unfamiliar with the highly technical material which they had to master and present as part of the scenario. In many ways the task of the writer, either patient or non-patient, was much easier than that of the doctor. The doctor had to use a certain amount of technical language and had to be convincing in attempts to describe his work. He had to act with authority in persuading the member of the staff who played the role of writer/patient to stop smoking. It is impossible to say whether the anxiety generated by the necessities of the role decreased the impact of role-playing or lent urgency to the examination of the data and thus increased the likelihood of an impact.

There were no significant differences among the various experimental groups in the frequency with which subjects smoked while they were taking the post-experimental questionnaire. It had been found in our prior study that subjects who smoked during the post-experimental questionnaire were very unlikely to cut down on their smoking during the period immediately after the study. This was not found with the current sample. There was also no difference among the various groups in the proportion of subjects who indicated an interest in attending the assistance sessions, or indeed, in the actual number attending these sessions. In fact, the control group which role-played an interview on driver safety was well-represented both among those indicating an interest in assistance sessions and those actually coming. This is further indication that this

control group did not have totally neutral experiences; the act of taking the test of Subjective Expected Utility for the second time may indeed have led to the subject's reexamination of his or her own smoking behavior.

One of the questions in the long-range follow-up asked about the way in which subjects recalled their experiences during the study. A content analysis of these commen yielded three kinds of themes (cf. Table 13 for examples of comments in each classification and a count of the frequency of each in the various experimental groups).

Insert Table 13 about here

Roughly half of the subjects in each group reported positive feelings about their experiences; half gave negative reactions to the study. About half also described rationalizations for continuing to smoke.

The Role of Learning

It will be recalled that hypothesis 5 (page 13) concerned the effect of the acquisition of information on change in behavior. To explore this question a test was devised covering the items of information included both in the role-playing scenario and in the briefing and semi-programmed material given to Group 4 (the "learning-only" control group). This test was completed by all subjects including those in Group 5, the non-smoking related control group. A similar test covering the material about automobile safety presented to Group 5 was also administered to all subjects. For the text of these tests see Appendix D .

The mean level of information acquired by changers and non-changers was

almost identical. A comparison of the various study groups (see Table 14) showed that the level of information on the posttest of learning was almost exactly the same among

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Insert Table 14 about here

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the four groups exposed to the material relating to smoking. Only the control group showed a level of information on this subject outside the confidence limits and therefore significantly low. Similarly, the four groups exposed to information on smoking uniformly showed little increase in information about automobile safety; in contrast the control group acquired a great deal of information on this subject. Information scores were also unrelated to the subject's indication of interest in attending assistance sessions or to actual attendance at these sessions. Lastly, in no analysis (see below) was the gain in information or the absolute level of information about the effects of smoking on the respiratory or cardio-vascular systems related to any of the measures of reduction in smoking.

In summary, both role-playing and non-role-playing exposures were effective to an equivalent degree in promoting learning. The similarity in response between role-playing and "learning-only" subjects and the lack of relation between level of learning and change in smoking leave open the question of the contribution of learning new information to the effect of role playing.

The Prediction of Change in Smoking

Since there were no significant differences in the degree of change in smoking following participation in the activities of the experiment by subjects in the various

experimental groups, it seemed appropriate to pool all of the subjects in order to examine individual characteristics for their ability to predict reduction or elimination of smoking. Parallel analyses were carried out using two kinds of comparison. The first was the comparison of those subjects who reduced their smoking by half a pack of cigarettes a day or stopped and those subjects who either maintained their smoking levels or reduced by lesser amount than half a pack a day. The second comparison used regressed scores and compared smokers with negative regressed scores, i.e. subjects whose post-experimental smoking levels were less than that predicted by the regression line of pretest on posttest smoking levels, with subjects whose regressed scores were positive. In each of the following discussions the tables indicate which of the two comparisons is being used.

Subjective expected utility and change in smoking: It may be helpful at this point to review briefly the character of the SEU scores. The basic elements of SEU are the value placed on an outcome of continuing to smoke or stopping, the expectation of likelihood of occurrence of this outcome should the subject continue to smoke and the expectation of the likelihood of the occurrence of this outcome should the subject stop smoking. Overall SEU includes a score based on the sum of SEU for each outcome indicating the utility of continuing, another score indicating the utility of stopping, and a third score indicating the product of value by the difference in expectation between continuing and stopping. The last of these scores gives some measure of the degree to which a change in smoking status has positive or negative utility to the smoker. Despite the fact that the last of these is dependent on the first two, it is a useful indication of attitudes towards change in smoking. For example, a subject who placed high value on

the kinds of outcomes included in the test and expects these to occur whether or not he smokes, might have a high SEU for both continuing to smoke and stopping but an SEU around zero for the difference. Another who expected favorable consequences from stopping and unfavorable consequences from continuing might have positive SEU for stopping, negative SEU for continuing, and a very large SEU for the difference. A similar series of scores was computed for each of the subscales derived from factors based on a varimax rotation.

Lastly, both for overall scores and for the subscales a regressed score was calculated based on the difference between the actual post-experimental score and that predicted by the regression line of post-experimental on pre-experimental scores. Regressed SEU scores provide an indication of the degree to which subjective expected utility was affected by experiences during the experiment.

The relation between change in smoking, as indicated by regressed smoking score, and overall SEU for the difference between continuing to smoke and stopping is described in Tables 15 through 17. As compared to non-changers, subjects who later

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Insert Tables 15, 16, and 17

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reduced their smoking levels came to the experiment with a higher utility for stopping than continuing (i.e. the SEU was negative when value was multiplied by the "continue minus stop" expectation). This difference persisted on the posttest, as indicated by Table 16. Changers were affected somewhat more than non-changers, but the difference,

although in the predicted direction, is not significant (cf. Table 17).

When the SEU for stopping and that for continuing are examined separately, the results are similar to those previously found for college students. The pretest scores on the utility for stopping strongly differentiate changers from non-changers both with absolute change scores (see Table 18) and regressed smoking scores. In contrast there is

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Insert Table 18 about here

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no significant difference between changers and non-changers on the utility for continuing to smoke (see Table 19). However, the experiences of participating in the

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Insert Table 19 about here

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study did lead to a decreased utility for continuing to smoke among the 17 subjects who either reduced their smoking levels by half a pack or more or stopped; their SEU is below the mean score for the non-changers. The difference approaches but does not reach significance (see Table 20).

Insert Table 20 about here

Factor scores on the SEU and change: Changers and non-changers differed on several of the individual factor scores. One of the most important was the regressed SEU for the impact of continuing to smoke on the health (see Table 21). Presentation of a

Insert Table 21 about here

series of analyses by individual factors would be extremely cumbersome. Furthermore this would pose problems of interpretation. Although the factors are derived from a varimax rotation, they are not fully independent. Therefore, it seemed more reasonable to use factor scores as well as overall SEU scores in a multiple regression analysis for evidence of the degree to which each of these factor scores provides independent predictive value. Tables 22 and 23 show a summary of these multiple regressions, the

Insert Tables 22 and 23

former with the absolute value of change in smoking as a criterion and the latter with regressed smoking scores as a criterion. All variables significantly correlated with each of the criteria were introduced into the analysis.

The reader may return to Table 3 for a specification of the items making up the scales which were predictive of reduction in smoking. In some instances it was the pretest levels, in others changes induced by the experiment in responses to items in this scale which were predictive. In general, subjects for whom the experiment led to a decreased utility for smoking as a support for self-concept showed reductions in smoking levels. Similarly, subjects who placed an Increased value on having non-smokers as friends and a decreased value on the use of smoking to avoid looking "wrong" to friends showed significantly lower regressed smoking scores than subjects for whom these utilities

operated in the opposite direction.

Patterns of support for smoking and change: In contrast to our data from college students, scores on the test of Patterns of Support did not, with one exception, predict short-range change following the experiences of participation in the experiment. Thus the factors measuring smoking for tension reduction or in response to craving (psychological addiction), which were highly predictive of change among the college students, did not differentiate between changers and non-changers in the current study. The one factor on the test of Patterns of Support which was predictive of the impact of the experiment was a two-item scale indicating the degree to which subjects used cigarette smoking to support social self-concept (see Table 24).

Insert Table 24 about here

Prediction of Long-Range Change

There was no significant difference in the levels of smoking among the various experimental groups at the time of the six-month follow-up. Given the slight impact of the experiences the subjects had during the course of the experiment, it is most unlikely that the effects, if any, would have lasted that long.

However, the subjects' smoking status after six months did reflect their pre-experimental responses on both the measures of SEU and Patterns of Support. In contrast to the results of the short-range follow-up, overall measures of subjective expected utility no longer differentiate changers from non-changers. Two of the factor scores do significantly differentiate smokers above and below the regression line for smoking at the pretest compared with smoking six months later. A lower level was associated with

the expectation that the smoker would be able to reduce tension if he continued to smoke (see Table 25) and with the subjective expected utility of the stimulation to be obtained from smoking (see Table 26). The fact that there are six factor scores, and

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Insert Tables 25 and 26 here

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three components of subjective expected utility for each, a total of eighteen possible scores, tends to decrease the importance to be attached to the fact that F-tests for two of these scores are significant. However, the continuity between these findings and the much more extensive relations between SEU and reported change in smoking on short-range inquiry supports the belief that there really is a difference in some aspects of subjective expected utility between subjects who maintained reduced levels of smoking after six months and those who did not.

Long-range changes in smoking were more effectively predicted by some parts of the Test of Patterns of Support. Two of the six factors showed significant differences between changers and non-changers in the predicted direction. The first is the score on the factor describing craving or psychological addiction (see Table 27). The second is the subtest describing the tendency of smokers to smoke habitually (see Table 28).

Insert Tables 27 and 28 here

This finding is in marked contrast to the fact that these scales did not show any relation with tendency to change immediately after the subjects' participation in the experiment.

Individual Characteristics as Predictors of Change

Approximately two-thirds of the subjects were women, one third were men. There were no significant differences in level of change on either the short-range or the long-range follow-up between men and women. There were no interaction effects between any of the predictors of change and sex. There was a variety of minor differences between men and women in some of the pretest measures, but none seemed to be related either to smoking levels or to reactions to the experimental situation. The two measures of anxiety, the Taylor Manifest Anxiety Scale and the Test of Situational Anxiety, did not relate significantly to any of the measures of reduction in smoking levels.

It has been reported (Straits and Sechrest, 1963) that quitting occurred primarily among smokers who are internally oriented, that is, among those who have the feeling that they can control their own destinies. In contrast, subjects who are externally oriented, i.e. fatalistic, did not try to stop smoking. In our own previous work with college students, no such first order effect was found. However, a number of interactions did emerge; these demonstrated that "subjects who were internally oriented changed if there was an increase in the value they assigned to the favorable effects of stopping on health; fatalistic subjects changed despite their temperament if they developed an increased expectation of good health from quitting and ill health from continuing to smoke." (Mausner and Platt, 1971, p. 152).

In the current investigation, a main effect relating internal/external orientation to change was found (see Table 29). Unexpectedly, reductions in smoking in this adult

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Insert Table 29 about here

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group occurred more frequently among externally than among internally oriented subjects. This finding may be clarified by an analysis of the interaction of several other variables with I/E. The first is the change in values induced by the experiment (regressed value scores). As indicated in Table 30, reductions in smoking occurred

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Insert Table 30 about here

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primarily among subjects who were externally oriented and for whom the value of the various outcomes of smoking was reduced by the experiences of the experiment. An examination of the items indicated that the primary effect was reduction in the value of positive outcomes of smoking. A similar two-way analysis between I/E and the social self-concept scale on the test of Patterns of Support (see Table 31) reveals that change

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Insert Table 31 about here

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occurred primarily among externally oriented subjects for whom smoking gave little support for the self-concept.

Although there are no interactions between I/E and change in overall SEU, there are interaction effects with the overall SEU scores on the pretest. Apparently those fatalistic (high I/E) subjects who cut down came to the experiment with negative utilities for continuing to smoke as well as for stopping (see Tables 32 and 33).

Insert Tables 32 and 33 here

Given their fatalism and the conflicted nature of their utilities it is not surprising that subjects who reduced temporarily but then returned to their prior levels of smoking are significantly high in I/E. An interpretation of these findings will be suggested below.

Results of the Assistance Sessions

Appendix F reports in detail on some of the events of the assistance sessions. Only a small minority (17 out of 48) of the subjects who indicated an interest in assistance sessions actually attended them. The discussions during the assistance sessions were reminiscent of the kinds of discussions common in other smoking clinics which have used a small-group technique. The participants indicated that smoking was thoroughly integrated into many aspects of their life patterns. Some of the stories of dependence on cigarettes were remarkably poignant. During the course of the assistance sessions almost all of the participants either reduced or eliminated their levels of smoking temporarily. However, by the time the sessions ended, virtually all had returned to their initial smoking levels. The one person about whom one can unequivocally say that the experiences of the experiment led to a permanent elimination of smoking was Mr. Luck, one of the two members of the staff who participated in the experiment as a role player. Mr. Luck also assisted the writer in the initial assistance sessions and led a number of them towards the end of the series. He stopped smoking during the course of the experiment and has not resumed.

Thoughts During the Experiment

One of the techniques used to evaluate the impact of the experiences during the experiment was a questionnaire asking the subject to indicate what he or she was thinking

about during the course of the experiment. Table 34 shows the themes identified by a

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Insert Table 34 about here

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content analysis of the comments and the frequency with which these themes were identified in the protocols of subjects in each of the experimental groups. In the tabulation more than one comment per subject could be recorded, but no more than one comment per subject was entered for each category.

Several points emerge from an examination of this material. Firstly, a focus on the impact of smoking on health was most common among subjects who were playing the role of doctor, next most common among the subjects who did not role-play but instead learned facts about smoking (Group 4), and was relatively uncommon among those who played the role of writer or writer/patient. It was, of course, virtually absent from the comments of those control subjects whose role playing was concerned with automobile safety (Group 5). The doctors and writer/patients regarded the experiment quite positively, with 22 positive to 5 negative comments among the doctors, and 25 positive to 8 negative comments among thewriter-nonpatients. The writer-patients were led by their experiences to focus on their own smoking, as did the "learning-only" controls. The latter made somewhat more negative comments than other subjects.

Discussion

The introduction to this report presented a series of hypotheses to be tested in this study. Following is a brief summary of our findings as they reflect on these hypotheses.

1. As was predicted, smokers with positive subjective expected utility for stopping tended to reduce or eliminate smoking following the experiences of the experiment in larger numbers than smokers who did not have a positive SEU for stopping. However, in contrast to our expectation, it was the pretest level of overall SEU which was predictive rather than the impact of the experiences of role-playing on SEU. A specific aspect of SEU whose change during the experiment led to decreases in smoking was the factor describing the utility of effects of smoking on health.

2. In contrast to the college students previously studied, some of the adults in the current study decreased smoking levels despite their dependence on smoking for tension release or relief from craving. That is, neither the use of smoking to reduce tension or alleviate craving was predictive of short-range change. However, scores on two of the scales in the test of Patterns of Support, i.e. psychological addiction and habit, did predict long-range change. Implications of this finding as well as the relation of short-range and long-range change to subjective expected utility will be discussed below.

3. About the same proportion of subjects who played the role of "doctor" cut down immediately after role-playing as did the "doctors" among the college students. However, the level of decrease among the control subjects was sufficiently great that there was no significant difference between role-playing and control groups. As was true among the college students, relatively few of the subjects playing the patient's role cut down substantially or stopped. However, a considerable number did cut down by modest amounts.

4. A major goal of the current study was to assess the degree to which failure to change among the "patients" in the study of college students was due to their focusing on themselves and on their personal problems with smoking rather than carrying on a disinterested survey with the heightened attention produced by role playing. The current data seem clearly to disconfirm this hypothesis. The manipulation was successful; the "writer-patients" reported a great deal of concern about their own smoking during the role-playing experience. In contrast, the subjects playing the role of writer-nonpatient indicated in their post-experimental questionnaires that they were not at all concerned with themselves. And they showed the lowest level of change among all the experimental groups.

5. Group 4 (learning only) was included to test the degree to which mere exposure to new information would lead to change in smoking. The results are equivocal. A somewhat smaller proportion of the subjects who merely learned the information without role playing changed than was true among the "doctors." However, the differences are not significant. Further, there were about as many subjects who reduced their smoking levels among a control group who did not have similar opportunities to learn, and who, indeed, did not materially increase their information about smoking. This argues that it was not the learning which led to change but rather something else about participation in the experiment.

The implications of the finding that our experimental procedures affected externally rather than internally oriented subjects are unhappily clear. Fatalistic subjects who were impressed with the attractions of being able to live without cigarettes

did make an effort to cut down. But, lacking the controls characteristic of internally oriented people, they gave up the effort all too soon. The contrast with the college students is that a considerable number of internally oriented college students did reduce their smoking, and those who had no strong need for cigarettes were successful in maintaining the reduced levels over long periods of time. Apparently, the subjects in our adult group with a similar psychological make-up must have satisfied themselves that there was no need to stop smoking; they either refused to participate in the study or, if they did come out of an obligation to the PTA, they remained untouched. If this analysis is correct, it implies that many of those adults who could stop smoking have already done so and that the success of anti-smoking campaigns will diminish as time passes.

There is much evidence that powerful selective effects determined the participation of subjects in the current experiment. While it is certainly not true that all subjects were poised to change their smoking behavior, it is probabl that a fair proportion were sufficiently concerned about their own smoking that they were more likely to participate than subjects who either did not care or were unwilling to have their decisions to continue to smoke under attack. The fact that the primary predictors of change are found in the pretest argues, therefore, that almost any of the experiences of the experiment could potentiate change among some people who were about ready to change anyway.

However, there is some internal evidence which suggests that the experiences of the experiment <u>were</u> important. That is, the experiences of participating

apparently did potentiate change among those subjects who cut down or eliminated smoking immediately afterward. The first kind of evidence comes from the comments subjects made both immediately after the experiment and in their recall on the six-month follow-up. A fair number indicated that merely taking the test of subjective expected utility made them think about their smoking in a way that they had not previously done. Others told us that it was the experience of role playing that led to this new examination of their smoking habits. It is probable that subjects who changed immediately after the experiment did so because they anticipated positive consequences from a reduction or elimination of smoking. The particular role playing used in this study obviously was a weak procedure for inducing such change in utilities. But is probably did do so, especially for the one third of the group of "doctors" who cut down their smoking by half a pack or more.

Unfortunately, the attempts to cut down smoking were, in most instances, not followed by cessation. And lower levels were not maintained. The explanation for this lack of success in inducing a large proportion of the subjects to adhere to reduced levels of smoking or to stop entirely may lie in the effect of the particular patterns of support for smoking among our subjects. The subjects who decided to cut down or quit immediatel after the experiment included a fair number who had been quite dependent on smoking for tension release or who had considerable craving. These subjects cut down if their subjective expected utilities were affected by the experience of the experiment or, more likely, if they entered the experiment with utilities which made them ripe for a potentiation of change. However, those subjects who cut down rather than stopping

were put into an equivocal psychological condition in which every cigarette, even at the reduced level of use, reminded them of the rewards which smoking could afford. In some ways, as is suggested in the expanded argument along these lines in Appendix A, a reduced level of smoking represents an aperiodic reinforcement schedule among smokers for whom the cigarette is a powerful reward. Under such circumstances it is extremely difficult to eliminate almost any behavior.

When environmental conditions increase the need for cigarettes, it is hardly surprising that smoking levels return to the pre-experimental amounts. In the course of the long-range follow-up a number of subjects indicated that financial problems had been important in making them increase their levels of smoking. The period between the experiment and the follow-up was one of serious cutback in several of the major industries in the area in which we worked. Men who were laid off by the contracting aerospace industry and their wives reacted to the tensions produced by such an event by increasing the amount they smoked. This would be especially true, of course, for those subjects for whom smoking was a response to craving or to a need for tension reduction.

It is somewhat paradoxical that the ex-smokers in our population reported that they had depended on smoking for tension release and for other need-fulfillments at a higher level than did the current smokers. But these ex-smokers are people who had totally eliminated smoking. In some ways, therefore, they were immune from the temptation to increase smoking levels when things got tough. Actually, it is rather surprising that we found so low a rate of recidivism among the ex-smokers when one considers Horn's national data which indicate a very high proportion of individuals who

are ex-smokers have returned to smoking at each repetition of a national survey.

Evaluation

The following conclusions are presented in final evaluation of the two and a half year effort being reported.

1. Role playing will be an increasingly weak technique for inducing people to reexamine their smoking behavior as more and more of the population of smokers consists of people who are firmly committed to smoking because it fulfills deeply held needs. There is little in these data to argue the usefulness of role playing or any similar technique as a direct model for mass approaches to the control of cigarette smoking. However, role playing may still be valuable as a way of creating short-range reduction in smoking levels. By studying the factors which differentiate smokers who respond to role playing from those who do not, an investigator may develop some clues to approaches which could be applied in mass programs for the control of smoking. If role playing is further used, its content should evolve around an anticipation of future benefits from not smoking rather than a focus on the dangers of continuing to smoke. Appendix G discusses tentative attempts to develop such role-playing techniques.

2. The stability of the three-dimensional model (Mausner and Platt, 1971) for an understanding of patterns of support for smoking was again demonstrated by data from subjects in the current experiment. There is some indication that one differentiated recommendation to smokers on the basis of their patterns of support may be soundly based. This is the suggestion by Tomkins that smokers who crave cigarettes must stop entirely since reduction in smoking levels among such smokers are likely to be only temporary. If the data of the current experiment are confirmed in future replications, a similar

recommendation could probably be made to subjects for whom smoking is used for the reduction of tension.

3. The theoretical analysis which related changes in behavior to prior changes in subjective expected utility was clearly supported by the data of the current experiment The test of Subjective Expected Utility was again highly predictive of short range change and, to a lesser extent, was also related to long-range change. The character of the finding relating subjective expected utility to the decision to reduce or stop smoking may be important to those planning anti-smoking campaigns. The data suggest that it would be important to generate confidence among smokers that life would be better without cigarettes. A recent publication of the National Clearinghouse for Smoking and Health, the Smokers Aid to Non-smoking: A Scorecard, exemplifies this approach in an interesting manner. It asks the smoker to keep a diary for each day during an attempt to stop. The diary form contains reminders of all of the benefits which are probably gained from the effort to refrain from smoking. While there is some evidence that an increase in the consciousness of the ill effects of smoking on health would have favorable impact on decisions to change, the primary implication of the current data is that subjects who anticipate better health from not smoking than from smoking would be the ones who will change rather than the ones who fear poorer health from continuing to smoke.

4. Finally, the data of the current experiment suggest that the task of controlling smoking will become increasingly difficult. A very high proportion of the smokers who were contacted during the preparations for this experiment refused to participate even though there were strong social pressures to do so and the overt goal of the participation was the raising of money for a highly valued organization. On six-month follow-up

the smoking levels of those subjects who refused to participate in the experiment were, if anything, higher than had been found on the initial survey. About a quarter of the smokers who were identified were willing to participate, at least in the initial phases of the study. None of the manipulations we carried out had any marked long-range effect on their smoking behavior. It should be emphasized that this project was carried out not with volunteers, but with subjects who were approached by the experimenter. Despite the undoubted biases in the self-selection of participants, our subjects came closer to a cross section of the young and middle-aged adult population in a suburban area than is true for most studies. The writer feels that their lack of response, even though they had gained much information about smoking and its ill effects, and had undergone a vivid experience, is alarming. One cannot help but conclude that the problem of controlling cigarette smoking is a highly emergent one, and that further research on this important issue and continued effort in control are much needed.

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Appendix F

A Study of the Impact of Assistance Sessions for Smokers Attempting to Stop

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Appendix F

Assistance Sessions

Purpose

The assistance sessions were planned to provide a service to participants in the study. We did not expect to be able to carry out rigorous experimental analyses of the procedures we were to use. However, participation in the assistance sessions could be used as an indication of the effectiveness of the role-playing procedure and the long-range follow-up planned for the study as a whole permitted assessment of the overall experience of the sessions. We had originally hoped that a large proportion of the subjects in the experiment would participate in the assistance sessions; we had not expected much long-range impact of the brief experimental procedure, but expected that the continuing contact with the experimental team via the assistance sessions would strengthen any tendencies for role playing to lead to cessation of smoking.

Procedure

All subjects participating in the experimental phase of the study were given an opportunity to join an assistance group. Forty-seven indicated interest. Approximately ten days after each subject's visit to the College for the experiment we began to try to make an appointment for an assistance session by obtaining information by telephone about free times. We tried to assemble groups for meetings at the homes of participants. While most of the subjects indicated some free time and gave verbal assurance of their interest, in the end we were able to assemble only three groups. Of the 47 potential participants only 17 actually attended even one session.

Following is the procedure used in the sessions: the first session was spent in a presentation of some of the behavioral facts about smoking. Stopping was described as a re-engineering of life. The relative advantages of cutting down and quitting cold were contrasted. The participants took the Test of Patterns of Support on a self-scoring form, worked out their own profiles, and were then given a booklet with hints about ways of stopping smoking appropriate to people with high scores on each of the factors. They were asked not to try stopping for a day so that they could keep a diary in which they would record some of the events which accompanied the use of each cigarette and their reactions to the smoking. (See Mausner and Platt, 1971, pages 218-220 for Hints, page 34 for diary form.) Lastly, the participants were introduced to the concept of the "future diary" and asked to complete the "letter to a friend" (see Appendix G) describing in detail a fantasied success in stopping smoking.

The second session was devoted to a review of the medical facts about smoking, with special reference to the beneficial effects of stopping both on life expectancy and on morbidity. The participants then presented their diaries and discussed them, with emphasis on the role smoking played in their lives. Individual participants reported on their successes and failures. All participants were urged to set a "Q" date, i.e. a date on which they planned to stop smoking.

In the third and succeeding sessions participants discussed their experiences, the "future diary," and exchanged encouragement. These sessions varied considerably as the character of the participants' experiences were made starting points for different kinds of comments both by the staff and by fellow participants.

During all of the sessions we were fortunate in having the help of several ex-smokers from the Parents' Association who had been part of our pre-test sample and who volunteered to help us with the assistance sessions.

Participants

As indicated above, 17 of the 105 subjects attended one or more of the sessions. Table F-1 shows a breakdown of the attendance by experimental group and level of participation. No one experimental procedure made it more likely than any other that

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Insert Table F-1 about here

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subjects would participate; in fact 7 of the 17 came from control groups.

We were able to divide our entire pool of 105 subjects into the group who said they would come to the assistance session and did (n=17), those who said they could come and did not (n=30) and those who indicated no interest in coming (n=58). A series of analyses contrasting these three groups showed a clear gradient among these groups in several variables. (For a summary of these findings see Table F-2.) Briefly, these

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Insert Table F-2 about here

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subjects differed in both SEU and Patterns of Support. Those who actually participated in the assistance sessions came out of the study with more positive utilities for stopping than those who indicated interest but did not come. The latter were more positive in

their utilities than the subjects who showed no interest. However, as is characteristic of all our findings for SEU, there were no differences in the SEU for continuing to smoke. As with the findings for short-range change, it was the subjects who wanted to stop, not those who feared continuing, who came for help.

The differences among the three groups in regressed SEU for stopping and for change in smoking status suggests that the experience of the experiment did have a different effect on those who came to the assistance sessions and those who did not. We may, on this basis, consider attendance at the sessions as a criterion for the effect of involvement in the study.

Unhappily, the subjects who came were also those most dependent on smoking. They were significantly high on a scale of the Patterns test which combines items dealing with Tension Release and Psychological Addiction and significantly low on the scale dealing with the Pleasure derived from smoking. Our participants were in the classical pattern of dissonant smokers described by McKennell.

Results

The response of the participants to the sessions was, on the whole, quite favorable. Those who stayed with the sessions participated actively, seemed to value the group support, were especially happy to be able to work with the results of their Tests of Patterns of Support.

The long-range effect on smoking is less impressive. Eight of the 17 quit during the sessions, another five reduced to a few cigarettes a day. Six of the eight who stopped and four of the five who reduced maintained their change in smoking status for

some time past the completion of the series of sessions. But virtually all had returned to smoking at or near the pre-experimental levels by the time of the six-month follow-up (see Table F-I). Fourteen of the seventeen participants indicated that the assistance sessions had been helpful, none said that they had hindered attempts to cope with smoking.

Discussion

The results of this attempt to help smokers are not very encouraging. Of course, one could always dismiss a failure by suggesting that either the techniques or the personnel of the project were inadequate to the task. The techniques in this instance were based on the procedures of a number of smoking clinics whose success has been far greater than ours. There is no way of evaluating the personnel except to note that several of the participants were ex-smokers whose own success should have encouraged others.

Our view of this experience is that it strengthens our belief that the task of attacking smoking will become increasingly difficult. The participants were those smokers who were least likely to change; they gave evidence during the group discussions of their intense dependence on cigarettes. They were significantly higher than non-participants in the value they placed on stopping, but had little confidence (as indicated by a series of expectation items on the SEU test) in their ability to stop.

The experience of these sessions is not unlike that of many unevaluated smoking clinics. Had we reported only success during the sessions we could have boasted that nearly half of a group of "hard-core" smokers had successfully given up. The lack of

long-range success points up the need to avoid complacency when one thinks about the problem of smoking. It certainly argues the need for a continued search for methods which might be helpful to smokers who want to stop.

Table F-1

Attendance and Results of Assistance Sessions

Subject	Number of Sessions	Results	Initial minus 6-Mo. Level (no. of cigs.)
Doctor			
11095	9	†	0
11151	4	**	0
Writer/Non-patient			
21032	4	*	-14 (93%)††
21043	1	†	0
21081	1	†	- 5 (25%)††
21113	9	†	+20
21124	3	**	0
21205	10	+	-19 (95%)††
Writer/Patient			
31066	5		+10
31171	2	*	-69 (92%)††
Learning only (control)			
41033	7	†	-10 (50%) ††
41148	3	*	-10 (33%) ††
41158	4	**	+ 5
Irrelevant role playing(control)			
51016	5	**	+ 1
51059	7		0
51082	1		0
51154	3		0

* long-range reduction
** reduced temporarily, then resumed
† stopped temporarily, then resumed
†† percent of initial smoking level

Table F-2
Comparison of Subjects by Interest in and Attendance at Assistance Sessions

Variable	Interest and Did Attend $\bar{X}$	S.D.	Interest and Did Not Attend $\bar{X}$	S.D.	No Interest $\bar{X}$	S.D.	F
Patterns Test							
General Affect	374	55	325	82	298	78	4.47**
Pleasure	24	74	14	62	57	67	3.15*
SEU							
Regressed SEU: Continue	2	3	0	5	0	6	0.86
Regressed SEU: Stop	2	4	2	5	- 1	6	2.56
Regressed SEU: Cont.-Stop	0	4	- 2	5	1	3	3.49*
Post-exp. SEU: Stop (self-concept)	229	88	188	90	168	65	2.81*
Post-exp. SEU: Stop (tension reduction)	-264	69	-257	69	-220	69	2.81*
Post-exp. SEU: Self-concept (Cont.-Stop)	-123	95	-64	68	-45	48	6.53**
Post-exp. SEU: Tension reduction(Cont-Stop)	50	64	48	44	20	29	4.31**
Post-exp. SEU: Hedonic (Cont.-Stop)	-33	60	-46	64	- 7	52	3.16*
Post-exp. SEU: Stimulation (Cont.-Stop)	65	114	1	52	11	48	4.02**
Value: Stop for a year							
Pre-experimental	4	3	3	2	2	3	3.14*
Post-experimental	4	2	4	1	2	3	4.33**
Expectation of ability to stop for a Year							
Pre-experimental	17	24	26	30	28	33	0.51
Post-experimental	17	23	33	32	36	34	1.59

* $p<.05$
** $p<.01$

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Table I-A

Sampling of the Level of Participation in the Population of Parents Available for the Study

	N	%	Appointments Made	Appointments Kept (Pretest)	%
Smokers*	626	36.3	405	165	26.3†
Ex-Smokers*	454	26.4	273	144	52.7
Non-Smokers*	642	37.3	124	56	45.2
	1722		802	365	

* All smokers invited
** One of every two invited
*** One of every four invited

N.B. There were 2106 families on the list of parents. Of these 617 asked to be removed from the rolls of potential subjects, leaving 1489 families to be called.

† percent of total smokers since all were invited

Table I-B

Smokers Participating in the Experiment by Group and Sex

Group	Male	Female	Total
1. Doctor	7	14	21
2. Writer/Non-Patient	6	15	21
3. Writer/Patient	7	14	21
4. Non-role, learning only	7	14	21
5. Accident	9	12	21
	36	69	105

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Table 2
Summary of Factor Analysis of Patterns of Support for Smoking
(164 Adults, Pretest)

Loadings*	
	Factor 1: Psychological Addiction--9.6% of variance
+0.69	Much aware of fact when not smoking
+0.72	Gnawing hunger for cigarette when haven't smoked for a while
+0.73	Between cigarettes, get a craving that only a cigarette can satisfy
+0.70	Out of cigarettes, almost unbearable until get them
+0.66	Not contented unless smoking a cigarette
	Factor 2: Social Stimulation--6.0% of variance
-0.64	Part of enjoyment, steps I take to light up
+0.81	Part of enjoyment, lighting up, smoking with one I like
-0.82	Enjoy a cigarette more if offered by one I like
	Factor 3: Pleasure--5.1% of variance
+0.83	I find cigarettes pleasurable
+0.85	Smoking cigarettes is pleasant and relaxing
	Factor 4: Sensory Motor--4.6% of variance
-0.77	Part of enjoyment, watching the smoke as I exhale
-0.38	Part of enjoyment, steps I take to light up
-0.43	Handling a cigarette is part of the enjoyment of smoking it
	Factor 5: Offering Cigarettes--4.2% of variance
+0.72	If someone I am with takes out a cigarette, I offer a light
+0.82	I offer cigarettes around when I am with others
	Factor 6: Social Self-Concept--3.9% of variance
-0.78	Enjoyment, knowing I look "right" with cigarette in hand
-0.59	Smoking helps me show what kind of person I am
-0.36	If all in a crowd smoke they feel closer to each other
	Factor 7: Stimulation--7.2% of variance
+0.74	I smoke cigarettes to stimulate me, to perk myself up
+0.74	I smoke cigarettes to give me a "lift"
+0.61	I feel more like "myself" while I am smoking
	Factor 8: Habit-Self-Image--6.9% of variance
-0.77	I've cigarette in mouth, don't remember putting it there
-0.69	I smoke cigarettes automatically without being aware of it
-0.74	I light up, still have one burning in ashtray
	Factor 9: Tension Release--9.7% of variance
-0.76	When "blue" or want to take mind off cares and worries, smoke cigarettes
-0.72	Feel uncomfortable or upset about something, light up a cigarette
-0.64	I light up a cigarette when I feel angry about something
-0.61	Few things help better than cigarettes when I'm feeling upset

* "+" indicates positive, "-" indicates negative loadings for the scale on the individual factor

Table 2-A

Means, Standard Deviations, Numbers of Subjects Above Midpoint of Scale and Intercorrelation Matrix For Factor Scores on Test of Patterns of Support for Smoking: Subjects Who Participated in Every Phase of the Study (N = 104)

	Psych. Addic.	Social Stim.	Pleasure	Sens. Motor	Offer	Social Self-Con.	Stimu.	Habit	Tension Release
Mean	298	190	396	187	278	159	238	224	345
S. D.	89	83	76	79	89	56	88	91	89
N Subjects >300	46	12	94	16	48	4	23	20	68
% Subjects >300	44	12	90	15	46	4	22	19	65
Psych. Addic.	1.00								
Soc. Stim.	0.20	1.00							
Pleasure	0.16	0.01	1.00						
Sens. Motor	0.33	0.57	-0.04	1.00					
Offer	0.00	0.12	0.17	0.12	1.00				
Soc. Self-Con.	0.28	0.34	0.04	0.37	0.09	1.00			
Stimulation	0.45	0.38	0.22	0.35	0.10	0.39	1.00		
Habit	0.48	0.14	0.01	0.16	0.03	0.12	0.36	1.00	
Tens. Release	0.63	0.31	0.11	0.30	0.08	0.34	0.53	0.42	1.00

Table 3

Summary of Factor Analysis of Expectancy for Various Outcomes of Continuing or Ceasing to Smoke (164 Adults, Pretest)

Loadings*	Items with loadings above .40
	Factor 1: Self-Concept--8.75% of variance
-0.68	Feeling proud of yourself
-0.62	Other smokers envious of you
-0.51	Non-smokers respecting you
-0.65	Saving money
	Factor 2: Tension Reduction--9.10% of variance
-0.70	Being nervous
+0.57	Enjoying your coffee
-0.62	Feeling depressed or blue
+0.45	Being energetic
+0.59	Concentrating well
+0.45	Feeling really good when you first get up in the morning
+0.62	Feeling like "yourself"
-0.59	Becoming upset easily
+0.45	Working well
	Factor 3: Health--8.21% of variance
-0.45	Living longer than the average man
+0.42	Becoming short of breath
+0.58	Getting lung cancer
+0.70	Getting heart disease
+0.74	Having your teeth and fingers stained
+0.71	Getting bronchitis
+0.71	Coughing a lot in the mornings
	Factor 4: Hedonic-Esthetic--6.85% of variance
+0.76	Enjoying your meals
+0.55	Your home having a pleasant odor
+0.75	Having a good appetite
+0.43	Feeling really good when you first get up in the morning
+0.53	Gaining a noticeable amount of weight
	Factor 5: Stimulation--5.40% of variance
+0.67	Having something to perk you up
+0.73	Something to relieve short periods of boredom
+0.47	Being a slave to the habit
	Factor 6: Stimulation, other--4.15% of variance
+0.71	New friends you make would be non-smokers
-0.77	Looking "wrong" to your friends

* "+" indicates positive, a "-" negative, loadings for the scale on the individual factor.

Table 4

Comparison of MAS Scores for Non-Smokers and Smokers Above and Below Midpoint of the Scale on Psychological Addiction

	Sum of Squares	DF	Mean Square	F	p
Between	550.9	2	275.4	5.54	<.01
Within	10041.9	202	49.7		
Total	10592.9	204			

	Non-Smokers	Smokers Below 300 on Psych. Add.	Smokers Above 300 on Psych. Add.
Mean: Manifest Anxiety Score	13.7	13.3	16.9
S.D.	7.2	6.4	7.6
N	56	51	68

Table 5

Comparison on Pretest SEU for Change in Smoking Status (V X (Cont-Stop)) of Non-Smokers With Smokers Above and Smokers Below 300 on Psychological Addiction

	Sum of Squares	DF	Mean Square	F	p
Between	296479	2	148239	81.2	<.001
Within	368997	202	1826		
Total	665477	204			

	Non-Smokers	Smokers Below	Smokers Above
Mean: Value X Expectancy, Pretest	-112.8	-24.2	-31.9
S.D.	54.0	35.1	40.5
N	56	81	68

Table 6

Comparison on SEU for Stopping Smoking of Non-Smokers and Smokers Above and Below 300 on Psychological Addiction

	Sum of Squares	DF	Mean Square	F	p
Between	12839	2	6419	2.3	n.s.
Within	559651	202	2770		
Total	572490	204			

Mean: Value X Stopping, Pretest	Non-Smokers 95.6	Smokers Below 83.8	Smokers Above 75.2
S.D.	52.3	44.4	61.2
N	56	81	68

Table 7

Comparison on SEU for Continuing to Smoke of Non-Smokers and Smokers Above and Below 300 on Psychological Addiction

	Sum of Squares	DF	Mean Square	F	p
Between	205700	2	102850	37.6	<.001
Within	552122	202	2733		
Total	757822	204			

	Non-Smokers	Smokers Below	Smokers Above
Mean: Value X Continuing, Pretest	-17.2	59.6	43.3
S.D.	51.5	45.0	60.2
N	56	81	68

Table 8

Summary of Factor Analysis of Patterns of Support for Smoking (Ex-Smokers, 144 Adults, Pretest)

Loadings*	
	Factor 1: "General"--22.51% of variance
+0.72	When "blue" or want to take mind off cares and worries, smoke cigarette
+0.66	Gnawing hunger for cigarette when haven't smoked for a while
+0.75	Feel uncomfortable or upset about something, light up cigarette
+0.56	Smoking cigarettes is pleasant and relaxing
+0.67	Between cigarettes, get a craving that only a cigarette can satisfy
+0.71	I light up a cigarette when I feel angry about something
+0.75	I smoke cigarettes to stimulate me, to perk myself up
+0.81	Out of cigarettes, almost unbearable until get them
+0.66	When I feel ashamed or embarrassed, light up a cigarette
+0.74	Not contented unless smoking a cigarette
+0.87	Few things help better than cigarettes when I'm feeling upset
+0.75	I smoke cigarettes to give me a "lift"
+0.67	I feel more like "myself" while I am smoking
+0.55	If I see others smoking, I want to light up too
	Factor 2: Social I--5.02% of variance
-0.54	I offer cigarettes around when I am with other people
+0.74	If all in a crowd smoke they feel closer to each other
	Factor 3: Social II--6.37% of variance
+0.73	When with friends smoking heavily, tend to smoke more than usual
+0.62	Part of enjoyment, lighting up, smoking with one I like
+0.54	If I see others smoking, I want to light up too
	Factor 4: Habit--7.07% of variance
+0.76	I've cigarette in mouth, didn't remember putting it there
+0.61	Much aware of fact when not smoking
+0.58	I smoke cigarettes automatically without being aware of it
+0.62	I light up, still have one burning in ashtray
	Factor 5: Sensory-Motor--6.16% of variance
+0.61	Part of enjoyment, steps I take to light up
+0.73	Handling a cigarette is part of the enjoyment of smoking it
	Factor 6: Role-definition--5.91% of variance
-0.73	Enjoyment, knowing I look "right" with cigarette in hand
-0.74	Smoking helps me show what kind of person I am
-0.54	I smoke to keep myself from slowing down

* "+" indicates positive, a "-" negative, loadings for the scale on the individual factor

Table 9

Comparison of Smokers and Ex-Smokers on Scores Derived from a "General" Factor Indicating Level of Fulfillment of Needs from Smoking

Score	Ex-Smokers* N	%	Smokers** N	%
100-149	12	8	2	1
150-199	12	8	12	7
200-249	22	15	26	16
250-299	21	15	41	25
300-349	30	21	39	24
350-399	25	17	24	15
400-449	13	9	18	11
450-499	9	6	3	1
Total	144	100	165	100

* $\bar{X}$=296, s=94

** $\bar{X}$=300, s=77

Table 10

Design of the Role-playing Study

Group	Description	Men	Women	N
1	Subjects playing the role of "doctor" in an anti-smoking clinic.	7	14	21
2	Subjects playing a Sunday supplement "writer" doing a story on the clinic.	6	15	21
3	Subjects who, as "writer," become "patients" in the clinic.	7	14	21
4	Subjects who listen to a briefing, work through semi-programmed material with content equivalent to that of the role playing, but do not engage in role playing.	8	13	21
5	Subjects engaged in irrelevant role playing (an interview between the subject playing a "health educator," and a "writer" collecting material about automobile safety.)	9	12	21

Data are also included on the following groups of subjects:

1. 144 ex-smokers (86 men and 54 women).

2. 19 men and 26 women who attended the pre-experimental testing. sessions but did not participate in the experiment.

3. 38 men and 23 women who furnished smoking levels during the initial contact with the pool of subjects (members of the parents' association) but who did not come to the pre-experimental testing session (random sample).

Table 11

Changes in Levels of Smoking Five Days Following the Role-playing Experiment
(N = 21 Adults to Each Experimental Group)

Group	Number of Subjects: Increase Cigs./Day 10+	1-9	No Change	Decrease Cigs./Day 1-9*	10+*	(Stopped)	Total Increase N	%	Decrease N	%	Regressed Smoking Levels Mean	S.D.
1. Doctors	0	2	8	4	7	(0)	2	9%	11	52%	-0.8	5.6
2. Writers/Non-patient	1	1	15	3	1	(1)	2	9%	4	19%	0.4	5.6
3. Writers/Patient	3	1	3	11	3	(1)	4	19%	14	66%	-0.9	8.7
4. Learning only	1	4	7	7	2	(0)	5	23%	9	42%	0.9	5.0
5. Control	1	3	10	3	4	(0)	4	19%	7	33%	0.4	6.9
Totals	6	11	43	28	17	(2)	17	16%	45	42%		

* includes those who stopped.

Table 12

Changes in Reported Levels of Smoking--Long-Range Follow-up

Experimental Condition	N	Number of Smokers: Increase Cigs./Day 10+	Increase Cigs./Day 1-9	No Change	Decrease Cigs./Day 1-9*	Decrease Cigs./Day 10*	Stopped	Totals: Increase N	Increase %	Decrease N	Decrease %
1. Doctors	20	0	1	11	3	5	(2)	1	5%	8	40%
2. Writers/Non-patient	21	2	1	9	5	4	(3)	3	14%	9	42%
3. Writer/Patient	21	1	2	7	9	2	(1)	3	14%	11	52%
4. Learning only	21	2	1	7	7	4	(1)	3	14%	11	52%
5. Control	21	0	3	8	6	4	(0)	3	14%	10	47%
6. Pretested but no experimental session	45	2	8	18	14	3	(5)	10	22%	17	37%
7. No pretest or experimental session	61	15	9	19	4	14	(2)	24	39%	18	29%

* Includes those who stopped.

Table 13

Frequency of Themes in Analysis of Comments on Interview Six Months Post-Experimental

	Groups			
Impact, Experiment:	1	2	3	4
Positive Impact of the Study	9	13	9	9
"...stays in back of my mind how stupid smoking is. Experience made definite impression."				
"Good program--educational. Woke up to facts not aware of before. Reinforces my not smoking."				
"Cut back...immediately after coming to Beaver...think twice before light one."				
Negative Reaction to the Study	11	9	12	12
"Felt foolish--said to husband, was a 'doctor.'"				
"Foolish, prefer not to pretend."				
"Anybody who smokes knows dangers... Beaver sessions did not help."				
Rationalization for Continued Smoking	9	5	8	8
"everything today is hazardous--air even tuna (mercury poisoning) etc.				
"...Reconciled to fact that I smoke under tension, but am not going to worry about it."				
"Might help other people, but not me, unless I really wanted to quit."				

N.B. More than one theme was counted for each subject.

Table 14

Scores on Tests Measuring Amount of Information Learned During Participation in Study

Group	Test on Smoking $\bar{X}$	s	Test on Auto Safety $\bar{X}$	s
1. Doctor	4.6	1.7	3.7	1.2
2. Writer/Non-Patient	4.6	2.2	3.7	1.8
3. Writer/Patient	4.9	1.7	3.9	1.8
4. Non-role, learning only	5.2	1.9	3.8	1.5
5. Accident	2.3*	1.0	7.9*	1.4
	F=8.87, df=4,104 p<.01		F=29.57, df=1,104 p<.001	

* outside confidence limits for p<.05

Changers**	4.41	4.88
Non-Changers	4.32	4.56
	F=0.03, df=1,104 n.s.	F=0.30, df=1,104 n.s.

** regressed smoking score <0.0

Table 15

Comparison of Changers* and Non-Changers on Pre-Experimental Subjective Expected Utility for Smoking (Criterion: Regressed Smoking Score)

	Sum of Squares	DF	Mean Square	F	p
Between	5983	1	5983	4.26	<.05
Within	144564	103	1403		
Total	150547	104			

	Changers	Non-Changers
Mean SEU	-40.0	-24.9
S.D.	39.5	35.6
N	48	57

* regressed smoking score <0.0

Table 16

Comparison of Changers* and Non-Changers on Post-Experimental Subjective Expected Utility for Smoking (Criterion: Regressed Smoking Score)

	Sum of Squares	DF	Mean Square	F	p
Between	8374	1	8374	6.83	<.05
Within	126167	103	1224		
Total	134541	104			

	Changers	Non-Changers
Mean SEU	-45.1	-27.2
S.D.	39.3	30.8
N	48	57

* regressed smoking score <0.0

Table 17

Comparison of Changers* and Non-Changers on Post-Experimental Regressed Subjective Expected Utility for Smoking (Criterion: Regressed Smoking Score)

	Sum of Squares	DF	Mean Square	F	p
Between	1493	1	1493	2.45	>.05
Within	62719	103	608		
Total	64213	104			

	Changers	Non-Changers
Mean SEU	-4.1	3.4
S.D.	26.2	23.2
N	48	57

* regressed smoking score < 0.0

Table 18

Comparison of the SEU for Stopping Smoking among Changers and Non-Changers after Role Playing or Control Procedures

	Sum of Squares	DF	Mean Square	F	p
Between	10952	1	10952	5.39	<.05
Within	209120	103	2030		
Total	220073	104			

	Changers*	Non-Changers**
Mean SEU: Stopping	101.9	74.2
S.D.	41.3	45.7
N	17	88

* Reduced smoking levels by 1/2 pack/day or more or stopped: five-day follow-up.

** Increased, remained constant or reduced by less than 1/2 pack/day.

Table 19

Comparison of the SEU for Continuing to Smoke among Changers and Non-Changers after Role Playing or Control Procedures

	Sum of Squares	DF	Mean Square	F	p
Between	1044	1	1044	0.44	n.s.
Within	244363	103	2372		
Total	245407	104			

	Changers*	Non-Changers**
Mean SEU: Continuing	54.1	45.5
S.D.	54.8	47.5
N	17	88

* Reduced smoking levels by 1/2 pack/day or more or stopped: five-day follow-up.

** Increased, remained constant or reduced by less than 1/2 pack/day.

Table 20

Comparison on Regressed SEU for Continuing to Smoke of Changers and Non-Changers

	Sum of Squares	DF	Mean Square	F	p
Between	6948	1	6948	3.77	>.05
Within	189760	103	1842		
Total	196708	104			

	Changers*	Non-Changers**
Mean: Value X Continuing	-18.5	3.5
S.D.	40.3	43.3
N	17	88

* Reduced smoking levels by 1/2 pack/day or more or stopped: five-day follow-up.

** Increased, remained constant or reduced by less than 1/2 pack/day.

Table 21

Comparison of Changers and Non-Changers (Short-Range) on Regressed SEU for Continuing Smoking--Health Factor

	Sum of Squares	DF	Mean Square	F	p
Between	52950	1	52950	4.2	<.05
Within	1296657	103	12588		
Total	1349607	104			

	Changers*	Non-Changers**
Mean: Regressed SEU-- Continuing (Health)	-51.0	9.8
S.D.	98.3	114.5
N	17	88

* Reduced smoking levels by 1/2 pack/day or more or stopped: five-day follow-up.

** Increased, remained constant or reduced by less than 1/2 pack/day.

Table 22

Summary of Multiple Regression Analysis of Predictors of Change Following Role Playing (N=105 Adults) Criterion: Change in Smoking

Variable	Correlation with Criterion	Multiple R	F
Value x Expectancy: Hedonic-Esthetic, Pre-exp.	0.26	.26	7.18
Continue: Stimulation, other, Post-exp.	-0.22	.34	5.57
Value x Stop: Stimulation, Pre-exp.	-0.19	.40	5.45
Stop: Tension Reduction, Pre-exp.	0.22	.45	5.25
Regressed Value: Stimulation	0.19	.49	4.84
Value x Continue: Self-Concept, Post-exp.	0.16	.52	3.95
Regressed, Value x Continue: Health	0.17	.55	4.04
Regressed, Continue: Stimulation, other	-0.20	.55	1.00
Value x Expectancy: Stimulation, Pre-exp.	0.21	.56	0.97
Expectancy: Tension Reduction, Post-exp.	-0.18	.56	0.59
Expectancy: Tension Reduction, Pre-exp.	-0.24	.57	0.70
Value x Expectancy: Hedonic-Esthetic, Post-exp.	0.19	.57	0.60
Regressed, Value x Continue: Mean	0.18	.57	0.25
Regressed, Value x Expectancy: Self-Concept	0.18	.57	0.19
Value x Stop: Mean, Pre-exp.	-0.23	.57	0.10
Regressed, Value x Continue: Self-Concept	0.18	.57	0.10
Value: Health, Pre-exp.	-0.16	.57	0.06

Table 23

Summary of Multiple Regression Analysis of Predictors of Change Following Role Playing (All Subjects) (N=105 Adults) Criterion: Regressed Smoking Scores

Variable	Correlation with Criterion	Multiple R	F
Value x Expectancy: Stimulation, Pre-exp.	0.29	.29	9.11
Expectancy: Tension Reduction, Pre-exp.	-0.28	.37	6.98
Regressed Continue: Stimulation, other	-0.19	.43	5.62
Regressed, Value x Continue: Self-Concept	0.23	.47	5.02
Social Self-Concept	0.23	.49	1.93
Expectancy: Stimulation, Pre-exp.	0.25	.50	1.93
Stop: Tension Reduction, Pre-exp.	0.23	.51	1.45
Value x Expectancy: Mean, Post-exp.	0.25	.52	1.11
Value x Expectancy: Hedonic-Esthetic, Pre-exp.	0.22	.53	0.49
Value x Expectancy: Mean, Pre-exp.	0.26	.53	0.44
Value x Continue: Mean, Post-exp.	0.19	.53	0.50
Expectancy: Tension Reduction, Post-exp.	-0.22	.54	0.35
Value-Continue: Self-Concept, Post-exp.	0.22	.54	0.25
Regressed, Value x Expectancy: Self-Concept	0.19	.54	0.10

Table 24

Comparison of Changers* and Non-Changers on Social Self-Concept Factor of Test of Patterns of Support for Smoking (Criterion: Regressed Smoking Score)

	Sum of Squares	DF	Mean Square	F	p
Between	25631	1	25631	9.7	<.01
Within	271235	103	2633		
Total	296866	104			

	Changers	Non-Changers
Mean Social Self-Concept	69.2	100.6
S.D.	43.7	56.9
N	48	57

*Regressed smoking score <0.

Table 25

Comparison for SEU for Continuing--Tension Reduction Factor between Changers and Non-Changers, Six-Month Follow-Up.

	Sum of Squares	DF	Mean Square	F	p
Between	795	1	795	4.46	<.05
Within	26201	147	178		
Total	26997	148			

	Changers*	Non-Changers**
Mean: Pretest SEU for Continuing (Tension Reduction)	-19.5	-24.2
S.D.	12.4	14.0
N	64	85

* Reduced smoking levels by 1/2 pack/day or more or stopped: five-day follow-up.

** Increased, remained constant or reduced by less than 1/2 pack/day.

Table 26

Comparison on SEU for Change in Smoking Status (Continue-Stop): Stimulation of Changers and Non-Changers, Six-Month Follow-Up

	Sum of Squares	DF	Mean Square	F	p
Between	29235.3	1	29235.3	6.57	<.025
Within	653866.6	147	4448.1		
Total	683101.9	148			

	Changers*	Non-Changers**
Mean: Pretest SEU for Cont-Stop/Stimulation	-9.063	19.235
S.D.	72.171	62.271
N	64	85

* Regressed smoking scores <0.0

** Regressed smoking scores >0.0

Table 27

Comparison on Psychological Addiction Factor Scores of Changers and Non-Changers--Six-Month Follow-Up

	Sum of Squares	DF	Mean Square	F	p
Between	69565	1	69565	8.69	<.01
Within	1176525	147	8003		
Total	1246090	148			

	Changers*	Non-Changers**
Mean: Psychological Addiction	263.3	306.9
S.D.	78.7	96.6
N	64	85

* Regressed smoking scores <0.0

** Regressed smoking scores >0.0

Table 28

Comparison of Changers and Non-Changers on Habit Factor Scores--Six Month Follow-Up

	Sum of Squares	DF	Mean Square	F	p
Between	39327	1	39327	4.7	<.05
Within	1222692	147	8317		
Total	1262019	148			

	Changers*	Non-Changers**
Mean: Habit-Self-Image	195.5	228.4
S.D.	84.8	95.6
N	64	85

* regressed smoking score <0.0

** regressed smoking score >0.0

Table 29

Comparison of Changers and Non-Changers on Scores from the Test of Internal/External Locus of Control

	Sum of Squares	DF	Mean Square	F	p
Between	116	1	116	7.75	<.01
Within	1541	103	14		
Total	1657	104			

	Changers*	Non-Changers**
Mean: Internal/External	9.4	6.5
S.D.	4.4	3.7
N	17	88

* Reduced smoking levels by 1/2 pack/day or more or stopped: five-day follow-up.

** Increased, remained constant or reduced by less than 1/2 pack/day.

Table 30

Comparison on Regressed Smoking Levels of Subjects High and Low on I/E and High and Low on Regressed Values for the Outcomes of a Decision to Stop or Continue Smoking

	Sum of Squares	DF	Mean Square	F	p
Between	448	3	149	2.8	<.05
Within	5368	101	53		
Total	5817	104			

	High I/E High Reg. Val.	High I/E Low Reg. Val.	Low I/E High Reg. Val.	Low I/E Low Reg. Val.
Mean: Regressed Smoking *	-2.1	-6.0	-2.3	-0.0
S.D.	7.1	9.0	7.7	5.1
N	19	22	35	29

* five day follow-up.

Table 31

Comparison on Regressed Smoking Levels of Subjects High and Low on I/E and High and Low on Social Self-Concept

	Sum of Squares	DF	Mean Square	F	p
Between	378	3	126	3.05	<.05
Within	4167	101	41		
Total	4545	104			

	High I/E High S.S.C.	High I/E Low S.S.C.	Low I/E High S.S.C.	Low I/E Low S.S.C.
Mean: Regressed Smoking Levels*	0.1	- 3.3	- 0.1	2.7
S.D.	8.5	6.0	5.4	6.1
N	22	19	41	23

* five day follow-up.

Table 32

Comparison on Regressed Smoking Scores—Five Day Follow-Up--of Subjects High and Low on I/E and on SEU for Stopping

I/E

	Sum of Squares	DF	Mean Square	F	p<
Within Cells	4149	101	41		
Internal/External	143	1	143	3.5	0.06
Mean SEU: Stopping, Pretest	7	1	7	0.1	0.67
Interaction	245	1	245	5.9	0.02

I/E

	High	Low
Mean: SEU Stopping, Pretest		
High	1.81*	-0.11*
Low	-3.92*	0.46*

* regressed smoking levels: five-day follow-up.

Table 33

Comparison on Regressed Smoking Scores of Subjects High and Low on I/E and on Pretest SEU for Continuing to Smoke

Internal/External Control

	Sum of Squares	DF	Mean Square	F	p<
Within Cells	4217	101	41		
Internal/External	143	1	143	3.4	0.06
Mean: Value X Continuing, Pretest	7	1	7	0.1	0.66
Interaction	176	1	176	4.2	0.04

I/E

	High	Low
Mean: Value X Continuing, Pretest		
High	1.64*	0.10*
Low	-3.22*	0.58*

* regressed smoking levels—five day follow-up.

Table 34

Summary of Protocols on Post-Experimental Questionnaire Requesting "Thoughts During Experiment"

	Group 1	2	3	4	5	
Smoking Behavior:						
Stopping/Reducing	4	3	7	4	0	considering commitment not to smoke
	1	1	0	0	0	asks for help
	2	3	0	4	2	wants to quit
	0	2	1	2	0	family (obligation to; concern for)
	12	4	2	8	0	ill health (awareness of)
	1	1	0	1	0	cost
	0	0	0	1	0	religion
Continuing	6	4	3	12	0	self-esteem, negative (feel guilty, helpless)
	2	7	8	4	1	rationalizing, hedging
	3	2	1	0	0	no desire to quit
	0	0	0	1	0	tension reduction
	0	0	0	1	0	addiction
	3	0	0	2	0	weight
Impact:						
Positive	4	7	5	4	5	experiment interesting; enjoyable experience
	6	5	6	1	6	initial qualms; some feelings of nervousness, apprehension
	2	2	1	4	3	cooperative; desire to help others
	3	5	7	6	2	awareness, new knowledge
	7	6	11	9	3	self-examination; application to self
Rationalization	3	4	3	2	0	experiment well-intentioned, but--
	1	1	0	2	0	not frightened by information
Negative	4	1	6	8	1	repetition of media, of general knowledge
	1	3	1	1	1	resentful; felt foolish, childish
	0	1	0	0	6	negatively critical, antagonistic
	0	2	2	5	0	personal information wanted; not able to ask personal questions
	0	1	1	1	0	waste of time; rather be elsewhere

Appendix G

Novel techniques for smoking control

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Appendix G

Novel Techniques for Smoking Control

Group Role Playing

The finding that reduction in smoking levels occurred in about one third of subjects playing the role of a doctor discussing the results of an examination with a patient suggested that the set induced by this role playing experience might be a valuable means of encouraging smokers to attend to the evidence on the effects of smoking. Many subjects informally indicated to the experimenters that they had been hearing about lung cancer but had paid no attention until they had been forced to explain the risks of smoking to someone else. The results of this role playing were temporary when it was not accompanied by intensive intervention of other kinds. However, we hoped that role playing might be a good technique to assist smokers in making long range changes if it were combined with the experiences of a smoking clinic.

A group of participants in the first session of a smoking clinic watches two volunteers from their midst go through the scenario for role playing described in Mausner and Platt (1971). One plays "doctor," the other "patient." The "doctor" explains to the "patient" that some tests had been performed which show abnormal cells in his sputum. While this does not mean he actually has lung cancer, it is a warning sign. The "doctor" then assures the "patient" that it is very likely that the effects of smoking would be reversed if the smoker stopped. He stresses the fact that the patient would

feel proud of himself if he could stop and that he could find other ways of satisfying the needs fulfilled by smoking.

Participants are then given the attached forms. They are asked to imagine that they themselves are doctors and to imagine that they are talking with a particular person they know who smokes, someone who is not a close relative. The forms provide a check list for the conduct of this imaginary interview.

This procedure was carried out with the participants in three smoking clinics. One, with an attendance of 75, was organized by a joint group of the Chester County (Pa.) Cancer Society, Heart Association and Medical Society. The other two, with fifteen and twenty participants respectively, were organized by the Abington, Pa. YMCA.

No follow-up was attempted since it would not have been possible to separate the effects of the group role playing from those of other components of the program. An experimental analysis of group role playing was designed, but the governmental agency with whose personnel we had hoped to work did not approve the project (see summary of project activities).

The procedure ran smoothly in the three trials we gave it. At the moment, given the slight effectiveness of role playing in the laboratory, the writer is uncertain whether group role playing merits the elaborate trial which would be necessary to establish whether or not it is effective.

The Use of Fantasy

One of the major findings of the current study was that subjects who develop positive utilities for the benefits of stopping are more likely to make an attempt to stop

than those who develop negative utilities for the consequences of continuing to smoke. The success of McClelland in using fantasy to train individuals in achievement-oriented behavior by encouraging achievement fantasy suggests that a similar use of fantasy might have an impact on smokers in encouraging expectation of benefits from cessation. Following is a description of a technique we developed which would make it possible to test this thesis.

In its first version, in the laboratory, college students were asked to pretend to make a phone call to a friend, either a person of the same age or a high school teacher, whom they had not seen for a long time. A member of the staff acted the role of the friend. The subject was instructed to describe in detail imaginary experiences with a successful attempt to stop smoking. Attached are several transcripts of these conversations. The subjects were able to carry them out fluently and seemed to enjoy the pretense.

In a second version, participants in smoking clinics were asked to write a letter to a friend describing their success in stopping. We cannot present any data from these trials since we felt that the participants should not be asked to return their letters to us. Informal conversations indicated that the task was carried out easily by most of the participants and, so far as we can tell, that it would be ready to use in a formal evaluation.

Bandura and his colleagues (1969) have suggested that modeling is successful in reducing fear of aversive stimulation and would, therefore, be more effective than conventional desensitization. That is, they feel that exposure to a role model who carries out an activity the patient fears will lead to the patient's willingness to attempt

the feared behavior. The results of our research indicate that fear of the consequences of stopping smoking is a major factor inhibiting smokers from trying to stop. It is possible that the fantasy induced by the techniques described above operate in a manner similar to the modeling used by Bandura. It would be especially valuable to have a smoker pretend to carry out a variety of activities in which he normally smokes and work through the emotions generated by the prospect of not having cigarettes in these situations. This may result in a change in which not smoking becomes less fearsome and may, indeed, have a marked effect on decisions to attempt to stop. It would probably not affect the smoker's ability to implement the decision; the dissonant smoker would still have to learn how to cope with the needs which so often drive him to return to cigarettes after a short period of abstention.

Bandura, A., Blanchard, E. B. & Ritter, B. Relative efficacy of desensitization and modeling approaches for inducing behavioral, affective and attitudinal changes. Journal of Personality and Social Psychology, 1969, 13, 173-199.

McClelland, D. C. Motivating economic achievement. New York: Free Press, 1969.